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Editorial Notes

2½d. a Therm

THE preparatory and opening stages of this war have been very different from those of the last. In the Great War of 1914-18, as far as gas undertakings were concerned, their troubles came upon them by degrees. This time they began—with A.R.P.—long before the opening of hostilities, and, whatever the effect on other undertakings according to their situation, they fell upon the London Companies from the first day of war in a mighty avalanche. Evacuation of anything up to a million individuals, extinguishing of 100,000 street lamps, the almost complete cessation of night life, and economizing by consumers in general, brought to the London Group of Companies in September a drop in demand of approximately 25%.

They have "stood the racket" for two months, in hope of some improvement which has failed to materialize, but Sir David Milne-Watson last Friday, on behalf of his own Company and the other five, called a conference of the Press at Gas Industry House and handed out the bombshell of a 2½d. increase in price. Handled in this judicious manner, any question of an explosion was averted, since it gave the Companies the opportunity of explaining exactly the grim situation in which London's great public gas utilities are placed. We record in other columns, as a matter of first-rate general interest, the statement which Sir David made.

It explains the position so lucidly that it leaves little to be said, except to commiserate with the London Companies, with any others who are equally badly hit, and with the proportion of gas consumers who have remained at home and have been left to pay the bill by those who have fled the Metropolis. Actually the incidence of the whole of the adverse factors was practically immediate, so that for two whole months gas has been sold in London on a totally uneconomic basis—in fact, at least 2½d. a therm too low. Nothing is being claimed in respect of these losses; the money, said Sir David, must be regarded as gone for ever.

At the conclusion of his statement Sir David urged the Press representatives to give him the opportunity of clearing up any doubtful points. Needless to say, the first question raised was that of dividends, though it might be imagined that the strict control of gas company finances by Act of Parliament was well enough known even to the lay Press. However, even statutory minimum dividends cannot be paid if the money is not there to pay them and, as Sir David explained, there are so many uncertain factors in the situation that it would be idle to attempt to prophesy anything. As regards the effect of the increase of 2½d. on various types of consumer, it is estimated that in what is termed the "average" household there will be an addition to the bill of 7d. or 8d. a week; in the case of slot consumers about 4d. a week; and for old age pensions living in one room 2d. a week.

We hope, and believe, that the war will not have fallen with such full fury upon gas undertakings in other parts, but the position of many must be serious enough. In last week's issue, for example, we reported a statement on the Edinburgh Gas Department by Mr. James Jamieson, in which he recorded a drop of 17% since September 3. He, too, like the Gas Light and Coke, had been led by pre-war results to date to anticipate a monthly increase over the previous year's figures. Now that the Gas Industry has given the lead in London, we do not anticipate that the electrical undertakings will long hold back similar announcements. The loss of high-priced domestic lighting load must be a very serious matter for them.

A Commercial Research Force

ON assuming the office of President of the Fuel Luncheon Club, Colonel W. A. Bristow, who is a Vice-President of the Institute of Fuel, delivered a striking and forceful Address. We publish it in to-day's issue. What he urged was some constructive co-ordinated plan in the fuel and chemical industries—a plan on a national scale. "We have," he said, "no Ministry of Heat, Light, and Power, which should be the greatest and best equipped Ministry in the country. . . . The State provides the Army, Navy, and Air Force for our national preservation. . . . It is now also necessary for the State to establish a Commercial Research Force, not only to undertake pure research and experimental work, but also to

operate plants of ample capacity." Colonel Bristow had in mind the fullest possible use of our coal resources for the manufacture of basic products many of which at the moment are imported from abroad. He would have a frontal attack on synthetic processes such as the Fischer-Tropsch for the production of hydrocarbons—petrol, Diesel oil, lubricating oils, alcohols, and so on—and this without delay.

Colonel Bristow's suggestion for Government action in co-ordinating fuel supplies and extracting the utmost from the coal we possess in abundance is not new, but his contentions have added significance in view of the war conditions which prevail, and they are certainly deserving of consideration. Action such as he contemplates would stimulate expansion—and very great expansion—in the carbonizing industries, both high temperature and low temperature, which, of course, would be reflected in greater employment in the mining industry. His plan would make us more self-supporting in times of war and in times of peace. The question is the price we should have to pay for this self-sufficiency; whether, indeed, even as a war-time expedient, the plan would prove sufficiently attractive to warrant its wholesale adoption. Much thought in peace-time has been given to the various proposals put forward by Colonel Bristow. In particular there have been the findings of the Falmouth Committee (the Report of the Sub-Committee on Oil from Coal of the Committee of Imperial Defence, 1938), and more recently the Report of a Special Advisory Committee of the Labour Party; and we must bear in mind that for a long time now the Fuel Research Board has been busily engaged in investigating at East Greenwich synthetic processes, which work is in progress at the moment. It is obviously desirable, however, that attention should be focussed anew on the problem now we are at war. The efficiency of the Services depends on the supply of men and materials, and in coal we have a vast potential source of supply of the materials which are necessary for the successful prosecution of war.

Among the matters touched upon by Colonel Bristow was the manufacture of calcium carbide, of which there is no production in this country. Imports in 1938 totalled approximately 65,000 tons. He stated that, had this tonnage been made here, it would have necessitated the consumption of, among other raw materials, 52,000 tons of low or high temperature coke or anthracite. This is not a great amount, but the establishment of the carbide industry here would stimulate other industries for which it would provide the raw materials. It would be interesting to know, however, to what extent low-temperature coke is suited for carbide manufacture. We had understood that the essentials of the carbonaceous material used for the purpose are hardness and freedom from phosphorus. Most carbide factories in Europe used Welsh anthracite, but hard, high-temperature coke containing 7 to 8% of ash will, it is thought, function satisfactorily, provided the lime with which it is heated is in a sufficiently pure state—*i.e.*, if it contains not more than 1½% of magnesia. The hardness of high-temperature coke enables it to be used in circumstances in which a high ash content would make anthracite impossible. However, the main theme of Colonel Bristow's Address was the production of oil from coal by synthetic processes.

If ever any subject has been threshed out to its foundations, this one certainly has. We do not know to what extent the technique of the synthetic process has been developed in Germany ; the technique to-day in that country may be very different from what Papers presented before scientific bodies in this country three or four years ago told us. It will be recalled that the Falmouth Committee were impressed by the technical possibilities of synthesis of oils from coal by way of water gas. They even put forward the view that it would be useful if some commercial concern, or combination of firms, was willing to provide the capital for large-scale trials of the process in this country. At that time, however, some of the witnesses in support of the synthetic process—we quote from the report—" were obviously influenced in their views largely because of the scale of development which is taking place in Germany." Do the necessities of war mean that we should follow a path—which technically has obvious fascination—considered and re-considered in times of peace to be uneconomic? We should be the last to suggest cessation in our research on the problems of synthesis, and special measures to encourage the production of oil from coal may well be desirable. We cannot, however, share the view often expressed that supplies of natural oil are approaching exhaustion. Would the State at the present time be well advised to establish half-a-dozen synthesis plants? That was the Labour Party Committee's peace-time idea. As envisaged, their plan was to have put into employment 6,800 miners and 4,750 workers on the plants (including, by the way, a hydrogenation plant estimated to cost £5,000,000). To-day about 80,000 miners are unemployed —which fact lends a sense of perspective to the situation as a whole.

While research continues, as it must, the Gas Industry has its immediate part to play in the production of benzole and toluole; and in this regard long discussions on whether or not recovery will result in a slight profit or in a slight loss somehow seem out of focus. The Government has called upon gas undertakings to do all possible to extract toluole, and it can be assured that the Gas Industry will respond to the full.

Selling Appliances in War Time

EVERYBODY agrees, more or less, with the view we expressed a fortnight ago that the continued sale of gas appliances in war-time is not only a proper national service but is essential to the continued existence of the Gas Industry itself and of the manufacturing firms who have devoted immeasurable capital, research, and enterprise to the development of a market that would be closed to them if appliance sales were actually suspended. Before expressing that view in the "JOURNAL" we discussed it with a number of manufacturers, among whom we met a few who, by reason of the highly specialized nature of their products, were called upon to meet such a pressing national defence demand that they had no option but to turn a deaf ear to normal orders, and a small number, too, who, because they saw no prospect of selling a high-priced speciality machine—a luxury in war time, though a necessity in peace time—had lost their enthusiasm for the ordinary gas appliance market.

Our reason for recounting these exceptions now is to emphasize that they very definitely *are* exceptions, and to remove a misconception which seems to have arisen in some quarters from laying stress on isolated cases to which we referred, so to speak, *en passant*. We repeat unequivocally that the case of the vast majority of appliance manufacturers is quite different, and that they are ready and eager to produce as many appliances as the Industry can possibly absorb. We had such firms in mind when we spoke of the way in which they applied their research and technical skill to the problem of maintaining their business in the face of an international upheaval, and of changing over from materials of construction which may become scarce, or even unobtainable, to others equally or very little less suitable for the particular work in hand, thus enabling them to offer the Gas Industry a service entirely adequate to the necessarily restricted needs of the times.

Only last week, in dealing with scrap metal, we referred to thousands of old pre-enamel black gas cookers which had been diverted from the scrap heat to the Army canteen and the evacuation billet. It is almost a pity that those breaking-up contracts were suspended so promptly as they were, for the replacing of, say, 100,000 cookers with modern gas and labour saving appliances would have kept the cooker manufacturers busy for a time on really useful work. We do not believe that the increase in the price of gas will, in itself, hinder the

sale of appliances ; indeed, the reverse may prove to be the case if a thoroughly sound sales policy is maintained, with emphasis on the gas saving properties of the new products. We therefore repeat that the Gas Industry owes it as a duty, not only to consumers, but to all the manufacturers who have contributed to the building up of the Industry over the past century, to maintain a live appliance sales policy, and thus help to keep the Industry intact in readiness for the further big push that must follow the cessation of hostilities.

Women and War

"THE Women's Gas Council carries on in war-time." Behind this brief announcement from the W.G.C. Headquarters, introducing a statement on future policy, lies evidence of a determination to fulfil in even greater measure in the days ahead the valuable service which the Council set out to achieve, and of a realization that now, as perhaps never before, can the liaison between the Gas Industry and its women customers attain still further spheres of usefulness.

It is gratifying to learn that all Branches of the W.G.C. are already busy on National work—following Miss Halpin's lead in connexion with the W.V.S. In some cases members have formed themselves into groups to do canteen work, nursing, and first-aid, while those who have home ties are doing needlework and knitting for the British Red Cross and for men in the Services. Such identification with work of national importance stands out as an excellent contribution from a body for whose existence the Gas Industry was solely responsible. What further justification for the formation of the W.G.C. could be needed?

This, however, is but one side of the picture. While throwing the full weight of its effort into national work, the Council is maintaining and augmenting its primary function of co-operation with the Home Service Departments of member undertakings with a view to helping housewives in their domestic problems. Now, perhaps more than ever before, is the housewife in need of advice and assistance in a multitude of domestic matters, in many of which gas plays an important rôle. Requests for lectures have already been received, and this service will continue to be available for Branches of the Council and for other societies. Special lectures on food economy, on the best use of food in the A.R.P. larder, and how to feed children have been prepared, as well as others on food values and the economical running of the home in war-time. In addition, the Council's lecturer, Miss A. M. Wilson, B.Sc., has taken the qualifying examination for an official lecturer in preventive methods against chemical warfare, and before and since the declaration of war she has given short courses of lectures on this subject.

It is also pleasing to record that the Council's quarterly magazine, *Fanfare*, will continue to appear—with news of the national work being carried out by members of the Branches, articles on subjects which will help them in this work, and as many of the old features as space will permit. In this way it will form a valuable link to keep members in touch with each other as well as with the Council at a time when meetings are not encouraged. Moreover, it will enable those members who have left home with their children or to do war work to keep their interest in their old associations and in the Gas Industry.

Greater Need for Home Service

As we have suggested, present conditions emphasize the greater need for Home Service. War has brought inevitable changes in the Gas Industry. Almost overnight, its relations with its domestic consumers have had to be readjusted in accordance with the new circumstances. Sales activities and advertising generally have, unfortunately, been drastically curtailed in many instances ; but, as Mrs. Eileen Murphy rightly points out in the October issue of *Home Service*, the personal element in public relations work is recognized as being more important than ever before if the public goodwill so carefully built up in times of peace is to be retained and improved. Home Service, in fact, is the Gas Industry's best weapon for keeping its place in the public mind until the return of peace makes it possible to restart the immense work of sales development and expansion. In the same publication Mr. H. D. Madden observes that some of the women staffs of A.R.P. posts who find themselves with time to spare while on duty would be only too pleased to have a quiet chat with a Home Service Adviser on suitable recipes for quick meals. But it is in the home itself that Home Service will be very busy. At present there are numerous queries from people finding themselves cooking for doubled households with no increased facilities, or two families are now using one cooker. These and many other domestic problems will come readily to mind.

The "JOURNAL" recognizes the vital importance of the sales side and of fostering public relations through Home Service Departments. And it recognizes the added force attaching to such activities at the present time. For that reason, we were glad to include in last week's issue two authoritative contributions on the subjects of "War and Nutrition" and "Home Service in Wartime." Both are matters of paramount importance in these days, and both should be carefully studied in all their aspects by Managements and Home Service Departments alike. In summing up, may be quote from one of these? "Our measure of success in the domestic field during the trying times ahead will be determined to a greater extent by the service which we give in general and by the effort of the Home Service personnel in particular."

Gas Lamp Direction Indicators

We have already referred in these columns to the enterprise of at least one big town in bringing some gas lamps back into use as indications of the whereabouts of A.R.P. services. On a later page to-day we give illustrations and particulars of a similar step which has been taken in Coventry ; and it is noteworthy that in each case it is the *gas* lamps which have been adapted for this important purpose. The scheme at Coventry was submitted to, and approved by, the Midland Regional Director of A.R.P., who also approved the idea of appropriate symbols in addition to the lettering on the lamps. This is more particularly gratifying in that it signifies official sanction of the idea, and may therefore prove a source of encouragement to other areas to follow suit.

The indications, we are told, show up equally well by day as by night, and although only a low-power unit is employed it may be regarded as at least some small return on the considerable amount of capital lying idle in public lighting plant generally. Of even greater moment, however, is perhaps the prestige value of this vital service which gas is able to render in assisting the public in times of emergency. The square type standard gas lamp is, of course, peculiarly suitable for this treatment, as our illustrations show ; and all that is necessary is to substitute the specially marked panes of glass for the ordinary ones. Doubtless other gas undertakings will now consider submitting similar schemes to their local authorities on the strength of those which have been officially approved at Coventry and elsewhere.

In this connexion it is interesting to learn that a successful test of the system of screening Bolton's gas street lamps has been carried out. The test, it is reported, proved that the lamps, while invisible to aircraft, clearly defined the limits of the footpath and are thus a guide to motorists besides providing illumination for pedestrians. Mr. Hamer, the Bolton Lighting Superintendent, observes that if similar lamps were fitted all over the town, they could be extinguished by centralized control within two minutes. Incidentally, a number of British Standard Specifications are now available for gas and electric fittings for A.R.P. purposes, providing an even illumination of low intensity. It should be noted, however, that a written exemption notice should be obtained from the Police before experiments are made with any gas lighting units out-of-doors, since the use of any external lighting without police authority constitutes a contravention of the Lighting Restriction Order.

Personal

Mr. P. F. SCARTH, Joint Accountant of The Gas Light and Coke Company has retired after 41 years' service. He started as a junior clerk in the Accountant's Department at Kensal Green where he was for 14 years. He was transferred to chief office in 1912, and in 1926 was appointed jointly with Mr. S. H. Collins as First Clerk to the Chief Accountant. Two years later they were promoted Joint Assistants to the Chief Accountant. When Mr. H. E. Ibbs retired in 1935, Mr. Scarth was appointed to his latest position of Joint Accountant together with Mr. Collins. In addition to his wide experience of Gas Company accounts, Mr. Scarth's expert knowledge of rating and income-tax made him a valuable member of the various committees dealing with these subjects, which the National Gas Council has set up from time to time.

Mr. Scarth might equally well have followed a career in the technical side of the Industry, for he also had a sound training in gas manufacture. As an engineering student in 1902 he was awarded the City and Guilds First Prize and Silver Medal. He was one of the founders of the London and Southern District Junior Gas Association and was its first Secretary and Treasurer. In 1936, his Paper "Sales of Gas and Basis of Charges" gained for him the Junior Gas Association's Milbourne Medal and the Society of British Gas Industries' Silver Medal. Mr. Scarth has also been Joint Editor of the well-known "Field's Analysis."

Mr. Scarth has been succeeded by Mr. O. W. WELLS, Budget Officer, who joined the Company in 1934. Mr. Wells is a Chartered Accountant with extensive commercial experience in the City.

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Mr. R. B. POTTER has recently been appointed Chairman of Messrs. Simon-Carves, Ltd., Engineers, of Cheadle Heath, Stockport. Mr. Potter, who is 40 years of age, was educated at Winchester and Trinity College, Cambridge, where he took an honours degree in the Engineering School. He joined the staff of Simon-Carves, Ltd., in 1921, became a Director in 1931, and was appointed Vice-Chairman of the Company in 1937.

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Ald. Sir ALBERT BALL, Chairman of the Nottingham Gas Committee, celebrated, on Nov. 1, the 40th anniversary of his first election to the Nottingham City Council.

* * *

Mr. A. E. WITCHER, M.I.Mech.E., Managing Director and Secretary of the Haywards Heath District Gas Company has been unanimously elected by the Burgess Hill Water Company to fill the vacancy on the Board caused by the death of Mr. W. Wood, who was the Board's Vice-Chairman.

* * *

An interesting gathering took place at the Works Office of the Oswestry Gas Light and Coke Company on Nov. 3, when Mr. E. T. DAVIES, the retiring Engineer and Manager, was presented with a chiming clock after completing 33 years in the Company's service. Accompanying the presentation was letter signed by all the subscribers wishing him many years of happiness in his retirement.

Mr. J. V. BECKETT, who succeeds Mr. Davies in the capacity of General Manager, made the presentation and referred to Mr. Davies' long and successful service with the Company and to his pleasant and happy association with all. Mr. Davies thanked Mr. Beckett for his kind words and all who had contributed to the gift, and hoped that all would do their best for Mr. Beckett and for Mr. Charles, his Assistant at the Works. He wished them, the Directors and the Company, every success in the future.

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The position of Deputy Gas Engineer and Manager at Southport has been filled by the appointment of Mr. H. J. RISBY, who was one of five applicants interviewed by the Gas Committee.

Since leaving the South Metropolitan Gas Company, where he served for a number of years, Mr. Risby has been assistant to the Consulting Engineer of the Severn Valley Gas Corporation and Gas Consolidation, Ltd. He has for some time been prominently identified with the activities of the London & Southern District Junior Gas Association, having for the last two years acted as Assistant Hon. Secretary. In addition to his membership of the Institution of Gas Engineers, Mr. Risby holds a Diploma in Gas Engineering and the Silver Medal of the Society of British Gas Industries.

Obituary

The death has taken place of Mr. J. M. EDNEY, who for over 30 years was Secretary of the Berwick and Tweedmouth Gas Company.

The Women's Gas Council

A Statement of Future Policy

The Women's Gas Council carries on in war time. At a meeting of the Executive Committee held at Gas Industry House on Oct. 23, it was decided to continue many of the activities of the Council.

The quarterly magazine, *Fanfare*, will continue to appear, with fewer pages than formerly; but what periodical has not been subjected to a slimming process these days? Future issues will contain news of the national work being carried out by the members of the Branches, articles on subjects which will help them in this work, and as many of the old features as space will permit. Members of the Council are being urged to become annual subscribers to the magazine so that copies can be sent direct to them. In this way it will form a valuable link to keep members in touch with each other, and with the Council while meetings are not encouraged. It will enable those members who have left home with their children or to do war work to keep their interest in their old associations and in the Gas Industry.

Miss K. M. Halpin, Organizing Secretary, has been given an important post in Women's Voluntary Services. Already reports received at Headquarters show that all the branches are busy on national work. In some cases members have formed themselves into groups to do canteen work, nursing and first aid, and those who have home ties and less free time are doing needlework and knitting for the British Red Cross and for men in the Services. Patterns have been supplied from headquarters and information on various subjects connected with wartime conditions have been sent out.

Requests for lectures have already been received, and this service will continue to be available for branches of the Council and for other societies. Special lectures on economy in food, on large scale quantities, the best use of the food in the A.R.P. larder, and how to feed children, have been prepared, as well as others on food values, and the economical running of the home in war time. The Council's lecturer, Miss A. M. Wilson, B.Sc., has taken the qualifying examination for an official lecturer in preventive methods against chemical warfare, and before and since the declaration of war she has given short courses of lectures on this subject.

Standard A.R.P. Lighting Fittings

A further Specification in the A.R.P. Series of British Standards for Lighting Fittings has just been issued. This specification, BS/ARP 21, deals with fittings, both gas and electric, for providing an even illumination of an intensity of 0.2 foot-candles. There are now, therefore, BS/ARP specifications dealing with fittings for three intensities of illumination—namely, 0.002, 0.02, and 0.2 foot candles (BS/ARP 16, 20 and 21 respectively). The fittings must be used strictly in accordance with the directions given as regards spacing and mounting height, and in every case a written exemption permit should be obtained before the fittings are used out of doors, since the use of any external lighting without police authority constitutes a contravention of the Lighting Restrictions Order, 1939. Intending users of these lighting fittings should, therefore, make application to the police for an exemption permit.

Copies of these specifications may be obtained from The British Standards Institution, 28, Victoria Street, London, S.W.1; price 3d. post free.

Further Specifications

Copies of the following recently issued British Standard Specifications can be obtained on application to the Secretary of The Institution of Gas Engineers, 1, Grosvenor Place, London, S.W.1, at the prices indicated:

No. 853—1939: Calorifiers. (Price 3s. 6d.).
No. 870—1939: Micrometers (External). (Price 2s.)
No. 875—1939: Silica Basins, Crucibles and Capsules. (Price 2s.

Forthcoming Engagements

Nov.
14.—N.G.C.—Central Executive Board Meeting, 11 a.m.
16.—I.G.E.—Refractory Materials Joint Committee and Specifications Sub-Committee, Mellor Laboratories, Shelton, Stoke-on-Trent, 3 p.m.
17.—Southern Association.—Special Meeting of the General Committee, Gas Industry House, 11.30 a.m.

Dec.
8.—I.G.E.—Joint Committee on Complete Gasification Under Pressure, Gas Industry House, 2.30 p.m.
12.—B.G.F.—Fifth Annual General Meeting, Gas Industry House, House, 10.30 a.m.

Letters to the Editor

Public Utility Rating Assessments and the War

SIR,—The rating assessments of public utility undertakings are determined, generally speaking, by reference to their receipts and expenses. The assessments which are now in force were fixed at the time of the Second Quinquennial Valuation in 1934 or in some cases on re-valuation in subsequent years—a quite considerable number of counties having reviewed them following the postponement of the Third Quinquennial Valuation List until 1941. In either case the assessments reflect the value of the undertakings working under peace time conditions.

There has not yet been much actual experience of war conditions, but it is clear that the receipts and expenses of undertakings will be seriously affected. The reduction of consumption, especially in evacuation areas, the loss of public lighting revenues, and the general increases in costs must reduce profits. It may be possible to offset such losses by adjustments of price to a greater or less degree, but there will be many cases in which existing assessments will be excessive under present conditions.

It has been announced in Parliament and in a circular letter addressed by the Minister of Health to local authorities that the quinquennial re-valuation due to take effect both in London and in the Provinces in 1941 is to be postponed. There will, therefore, be no automatic review of assessments in that year or presumably for the duration of the war.

The terms of the Bill to give effect to the postponement are not yet available, but it is of vital importance to undertakings outside the Metropolis that they should do nothing to detract from the right of proposal under Section 37 of the Rating and Valuation Act, 1925.

The Rating and Valuation (Postponement of Valuation) Act, 1938, left Section 37 untouched, and it is essential to the interests of undertakings that that precedent be followed in the present case. Upon the assumption that this takes place, undertakings will be in a position to take steps to secure adjustments to their present assessments whenever the facts warrant it.

Accounts for the year ending Dec. 31, 1939, will include four months working under war conditions, and data may then be available to enable reasonably accurate estimates for the future to be made. If the position is then found to justify a claim to reduction in assessment, proposals would have to be served before March 31, 1940, in order to be retrospective to the beginning of the war.

It is important to bear this matter in mind during the intervening period, because, if accounts are not available before, say, the second half of February, a great deal of time is not available before the end of the rate period—i.e., March 31, 1940.

Two points, therefore, emerge from a consideration of the matter at this stage:

(1) It is essential that the proposed Bill should leave the right of proposal untouched outside the Metropolis.

(2) Early consideration should be given to the preparation of material to enable the pre-war and the war conditions of working to be compared.

Yours, &c.,
RYDE, SONS, & BROWNE.

2, Central Buildings, S.W.1.
Nov. 4, 1939.

Shutting Off Gas Mains

SIR,—Mr. Haseldine's point to which he refers in his letter to you is quite a good one, but reference to the article in question will indicate that the tube sleeve is carried up to within 5 in. of the road surface. It will thus be gathered that a space exists of at least 4 in. between the underside of the surface box lid and the top of the tube.

Again, as the initial stage of inserting the tube involves opening up the road and disturbing the sub-soil, it will be clear that, when the opening is filled up, the surrounding soil will be comparatively close and will offer the cushion around the tube referred to by Mr. Haseldine.

Yours, &c.,
A. G. R. KENNETT,
District Superintendent.

Isle of Thanet Gas Light and Coke Company.
Nov. 2, 1939.

Gas Rationing

Mr. Arthur Cuthbert, Engineer and Manager of the Stirling Gas Light Company, has kindly called our attention to an editorial article which appeared in the *Stirling Observer* on October 31, and we understand, in three other local papers. The views it expresses are so sound—even essential in these times—that we reproduce it in full.

What an immense sigh of relief (stated the *Observer*) was heaved by the people (and particularly the housewives) of Britain when the official intimation was made last week regarding the relaxation of restrictions governing the consumption of gas and electricity.

To know that we can use that extra 25% must give comfort to all of us especially when we think to what extent industry throughout the land is dependent on these services or when we consider that hundreds of thousands of shops, offices, and homes rely on these selfsame commodities as the sources of their heat, light, and power.

There is hardly one of us who does not know what minor hardships were borne during the short time when the restriction obtained, and the experience could hardly be called a pleasant one. The anticipation of the winter upon which we have now embarked, promised, from this viewpoint alone, to become a worrying time. First of all we asked ourselves "What can we do without?" or "Where can we effect the necessary saving?" only to give ourselves the answers, "We must have heat; we've got to cook our food, and most certainly we cannot do without light." And it became, therefore, a most perplexing problem. To the competent housewife who practises economy as part of her job it was difficult to know where to begin (and some nine million housewives cook by gas).

To run a household efficiently, wastage of all kinds must be reduced to a minimum, and in a great majority of cases the reduction of their consumption of gas and electricity seemed a practical impossibility.

In many cases thoughts and promises of a new radio, of some up-to-date lighting fittings; some new gas fires maybe; or a modern cooker, all had to be put aside in view of the national economy, for no one should think of installing any appliances or fittings which might be an added drain on our fuel resources.

"Too bad," we said to ourselves and tried to console ourselves by feeling that we were thus doing our bit.

Our first inclination, therefore, on hearing that our gas and electricity ration was to be restored to 100% of last year's quantity, was to say "Now we can use all the electricity we want and burn as much gas as we like, and now we may go ahead and have those little extra home comforts we had promised ourselves." If these were your thoughts, then you were sadly wrong—in part anyway, and such was not the interpretation of the relaxed measures that was intended.

While the allowance has been increased from 75% to 100% you may, if necessary, use as much as last year; but certainly not more, and because of that the need for economy must still be observed.

But your conjectures were incorrect only in part, and you need not forego those extra comforts, for up-to-date appliances and fittings can be synonymous with economy. You can have your new gas cooker, with its automatic oven control which uses just enough gas to cook the meal—and then turns itself down. If your rooms are chilly the new gas fires will heat them for as little as one penny an hour each. One single therm of gas will heat enough water for eight baths or give seventy hours of good light.

So that in these days of enforced economies we can all run our homes and businesses more efficiently and at same time obey the restrictions which, though necessary, need no longer be irksome.

William Murdoch Centenary

Arrangements in Scotland to commemorate the Centenary of the death of William Murdoch, to be held in Glasgow on Wednesday, Nov. 15, have been cancelled owing to the present emergency.

It had been arranged that Sir James Irvine, Principal and Vice-Chancellor of the University of St. Andrews, would deliver an Address, and it is hoped that this intention will be carried out when happier circumstances prevail.

Negotiations had taken place with the B.B.C., and plans were well in hand for the broadcast of a Feature Programme on the Life of William Murdoch, but this also has been unavoidably postponed. In the meantime interest in the Murdoch Centenary will be stimulated in the Press.

Because of the War the William Murdoch Memorial Committee has cancelled its plans to commemorate the centenary of the discoverer of gas for lighting. It is hoped, however, that the plans may be revived at a later date, and the members of the Committee have agreed to this course. They are therefore remaining as members of the Committee although at the moment its work is suspended. The Committee, which is headed by Sir David Milne-Watson, was set up some months ago.

News of the Week

For the Construction of A.R.P. Shelters and the purchase of new gas meters the Blackburn Corporation Gas Department are seeking powers to borrow a sum of approximately £10,000.

The Raising of £150,000 is to be recommended to the Nottingham City Council on Thursday next by the Gas Committee. The sum is required for the purpose of general extensions to the city's gas service.

The Increase of 3d. per 1,000 cu.ft. in the price of gas at Sowerby Bridge brings the charge up to 2s. 6d. per 1,000 cu.ft. within the Urban District and to 3s. throughout the remainder of the supply area. The discount for prompt payment still applies.

The Liverpool Gas Company is co-operating with the Voss Motor Co., Ltd., of Renshaw Street, Liverpool, in adapting private and commercial cars from petrol to gas operation. The first private car to be so adapted, a 12 h.p. Austin, has been fitted with a special carburetter and gas container.

Notice is Given by the Poulton-le-Fylde U.D.C. of their intention to apply to the Board of Trade for a Special Order under the Gas Undertakings Acts, 1920 to 1934, for the purpose, *inter alia*, of extending the limits of supply and to confer further general powers on the gas undertaking.

Evening Classes in trade subjects, including gas engineering, gas supply, and gas fitting, began at the Liverpool Technical College on Monday for third and fourth year students. Owing to the outbreak of war, the classes were not opened on Sept. 25 for the winter session, as was originally planned. No arrangements have yet been completed for first and second year classes.

A Gas Filling Station for motor vehicles has been established by the Keighley Gas Department at their Queen Street Works. A 12 h.p. van belonging to the Gas Department has been converted to use gas by way of demonstrating the efficiency and economy of this system; the price of gas in Keighley, it is stated, is about half the cost of the petrol equivalent. Other filling stations will be provided if the demand justifies.

The Recent Increase in the price of coal will not for the present affect the price of gas in Belfast. Mr. J. D. Smith (Engineer, Manager, and Secretary of the Belfast Corporation Gas Department) said that Belfast gas was raised 2d. per 1,000 cu.ft. on Oct. 1, which was considered adequate to meet extra expenditure, and that increase would probably carry the Department over at least to the first month of the New Year. In the light of other contingencies arising the price would then probably have to be reconsidered.

Questioned as to the Likelihood of an increase in the price of gas in the near future, an official of the Plymouth and Stonehouse Gas Light and Coke Company said: "We have not gone into the question yet." Ald. Sir J. Clifford Tozer (Chairman of the Plymouth Corporation Gas Committee) observed that it is quite impossible to indicate what the price of gas is likely to be in the near future. While every effort would be made to maintain the price at its present low level, they would have to give the matter consideration in the very near future in view of the considerable increase in the cost of coal; it rather looked as if they would be reluctantly compelled to increase the price of gas.

In the Third Number of the International Tin Research and Development Council's new quarterly review, *Tin and Its Uses*, are given accounts of the Council's Bureau of Technical Information, and of the free technical service offered to tin consumers. It is explained how these services may be utilized by firms who, under war conditions, are operating for the first time processes involving tin, and some examples are given of the difficulties encountered in the application of tin in various industries, and of the methods recommended to overcome them. Copies of *Tin and Its Uses* may be obtained free of charge upon application to the International Tin Research and Development Council, Fraser Road, Greenford, Middlesex.

Consumers Who Default in the payment of instalments on gas appliances on hire purchase at Blackpool will, in the case of prepayment consumers, have their slot meters set back sufficiently to cover the amount involved.

Gas for Power Purposes is to be increased by ½d. per therm at Johnstone. The price to ordinary consumers has already been increased from the last meter-reading. A scheme of gas stair lighting for tenements is to be undertaken.

In View of the Importance of chemical engineering at the present juncture, the Ramsay Laboratory of Chemical Engineering at University College, London, has reopened, and students will be accepted for training in chemical engineering and research forthwith.

The Gas Output of the City of Lincoln Gas Department for the six months ended Sept. 30 compared with the same period for 1938 showed an increase of slightly more than 25 million cu.ft. Street lighting in normal times consumes over 30 million cu.ft. per annum.

Following the Outbreak of War the Colne Corporation decided to suspend hire-purchase facilities in the Gas Department. Further consideration has now been given to the matter with the result that hire-purchase trading will be resumed subject to a slight modification of conditions.

An Increase in the Price of Gas of 6d. per 1,000 cu.ft. as from the December meter-reading is proposed by the Oldham Corporation Gas Committee. The present charge is 3s. 7d. per 1,000 cu.ft. up to a consumption of 4,000 cu.ft., with a sliding scale for quantities in excess of that amount. The restriction in street lighting is one of the causes of falling revenue which renders a revision of price necessary.

The Next Meeting of the Members of the Fuel Luncheon Club will take place at the Connaught Rooms, Great Queen Street, Kingsway, W.C. 2, on Thursday, Nov. 16, at 12.40 for 1.10 p.m., when the after Luncheon Address on "The Development of Modern Engines for Liquid and Gaseous Fuels" will be given by Mr. W. A. Tookey, M.Inst.C.E., M.I.Mech.E. The Chair will be taken by the President, Lt.-Colonel W. A. Bristow, M.I.E.E., F.R.A.S.

Experiments Are Being Carried Out by the Leicester Transport Department with a view to running the city's 'buses on gas. It is thought likely that the seats will be removed from the upper deck of each 'bus so as to make room for the gas bag. At present extensive use is made by the Transport Department of vehicles with Diesel engines, but the General Manager and Engineer (Mr. C. H. Stafford) has come to the conclusion that coal gas will be the best alternative fuel to offset the inconvenience caused by fuel rationing.

Application is to be Made to the Board of Trade by the Luton Gas Company for a Special Order under the Gas Undertakings Acts, 1920 to 1934, for the following purposes, *inter alia*—namely, to extend and define the limits within which the Company may supply gas: to empower the Company to raise additional capital by the creation and issue of further consolidated ordinary stock and/or new preference stock; to enable the Company to borrow on mortgage and to issue debenture stock; to fix a basic price for gas; to prescribe basic rates of dividend; and to enable the Directors to establish reserve, special purposes, and renewal funds.

More Rapid Progress is now being made with the restoration of lighting in the closes and stair landings of tenement properties in Glasgow. The Lighting Department of the Corporation is supplying shades for lamps that allow of the illumination being resumed without affecting the black-out. Bailie R. Y. Gemmell (Covener of the Lighting Committee) reported on Oct. 30 that about 30,000 of the lamps, of which there are altogether over 90,000, in these approaches to tenement houses in the city, are now being lit. Gas lighting is being used in 23,000 cases. Bailie Gemmell added that the work of fitting the shades is being speeded up, and that 5,000 lamps are now being dealt with each week.

Gas Lamps Adapted to Indicate Coventry's A.R.P. Services.

The accompanying illustration shows the manner in which gas street lamps in Coventry are to be utilized for indicating the whereabouts of A.R.P. services. The glass is painted black, with the letters in yellow, while the symbols are the appropriate colours—e.g., police, blue; first-aid, red; &c. The scheme was submitted to the Midland Regional Director of A.R.P., who approved the idea of the symbols in addition to the lettering.

The glass panes will be fitted in lamps within a radius of a quarter of a mile from each air-raid shelter and first-aid post, 200 yds. from police stations, auxiliary fire stations, and chief wardens' posts, and outside every police telephone kiosk. The indications show up distinctly both in the daytime and at night, the lamps being fitted with a low-powered unit which at the same time renders them invisible to aircraft.

The painting of the glass was carried out to the design of the Coventry Gas Department by Messrs. Austin-Penrice, a local firm of display artists, using a special process and materials impervious to heat and not liable to discoloration.

Iron and Steel Control

The position regarding iron and steel priorities for the Gas Industry is only very slightly varied by the amending Iron and Steel Control Order (No. 4) made by the Minister of Supply to supersede the earlier Orders issued by the Department. The form of the Article relating to maximum prices has been considerably altered and the fact that material may be sold at not exceeding the maximum price fixed by the Order or at the maximum price which may be in force at the time of delivery is made more clear.

One effect of the Order is to increase the prices of billets and heavy steel by £1 per ton, with corresponding adjustments in the prices of finished products. Maximum prices have been added for home iron ore, cinder and scale, high-speed steel, wire, forgings, steel castings, tyres, axles, and solid wheels and iron castings. Tanks and cylinders of which every sheet or plate is under $\frac{3}{16}$ in. thickness; iron ore for annealing, gas purification or paint manufacture; and iron castings which have been subjected to any process other than moulding, fettling, annealing, or painting may until further notice be acquired by exempted persons without licence. Under a Direction attached to the Order, pig iron, as well as high-speed steel, has been excepted from the various exemptions from licence, and in every case these require a licence.:

It is made clear in the new Order that the purpose for which certain persons are exempted from licence is limited to material for use in the United Kingdom. It is necessary for a stockholding merchant to obtain a licence to acquire any material for stock.

Cardiff Home Service Carries On

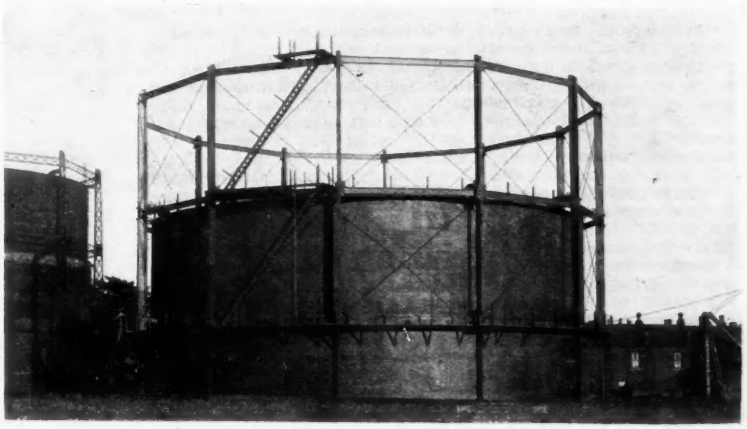
The Cardiff Gas Light and Coke Company, having obtained permission from the local authorities, decided to carry out their programme of weekly demonstrations planned before the outbreak of hostilities. That the decision was welcomed by consumers has been proved by the fact that each demonstration has been attended by "capacity" audiences, and expressions of appreciation from consumers have been numerous.

The Cardiff branch of the Women's Gas Council have recommenced activities, and the first meeting was held on Oct. 24, when a lecture was given by Miss Janet Bond, of the Canned Foods Advisory Bureau, and 150 members attended. Large numbers were unable to gain admittance. In addition to the regular monthly meetings, the Women's Gas Council have organized a working party. Meetings are held each week and much has been accomplished in their efforts to supply members of H.M. Forces, local hospitals and other services, with various kinds of articles for comfort and utility.

Cardiff is "carrying on" to some purpose. The only cause for complaint is that while before the war the lecture theatre provided adequate accommodation, it does not now do so. This evidence of public demand cannot be denied, and proves the desirability of giving effect so far as possible to the old slogan "business as usual."

New Leeds Gasholder

This new gasholder of 200,000 cu. ft. capacity was recently completed by Messrs. Clayton, Son & Co., Ltd., of Leeds, for the Leeds Corporation Gas Department, and was formally put into service by the chairman of the Gas Committee (Ald. A. R. Bretherick) on October 23. The holder embodies the latest improvements in design and construction, all the steelwork being pickled after fabrication and before painting. The steel tank is 84 ft. in diameter and the holder is prepared for oil filming.



Effect of War Conditions on

The London Gas Companies

Sir David Milne-Watson, Governor of the Gas Light and Coke Company, speaking on behalf of his Company and of the South Metropolitan Gas Company, the Wandsworth Gas Company, the South Suburban Gas Company, the Tottenham and District Gas Company, and the Commercial Gas Company, gave notice last Thursday before a gathering of the Press, that the price of gas in the area of all those Companies would be increased by 2½d. per therm from the date of the next reading of meters.

I am addressing you this morning, said Sir David, not as Chairman of the National Gas Council, so that my remarks have no general application to the Gas Industry. I speak to you as Chairman of the Gas Light and Coke Company, and I have associated with me here Mr. Frank Jones, Chairman of the South Metropolitan Gas Company, the Wandsworth Gas Company, the South Suburban Gas Company and the Commercial Gas Company, and Mr. Henry Woodall, Chairman of the Tottenham and District Gas Company. These gentlemen have asked me on the present occasion to act as their spokesman, so that I address you now on behalf of these six London companies, covering between them about 90% of the Metropolitan Area and a great deal of territory beyond it.

A Catastrophic Cut

It is my intention to tell you a plain, unvarnished tale of the way in which the war has affected the operations of these Companies. We began to feel its effects many months ago, when plans had to be made for the civil defence of our works and mains, and for the preservation, so far as that should be possible, of an uninterrupted gas supply in any foreseeable circumstances. Even in peace time the extent of our A.R.P. was very considerable, and our expenditure was substantial. The real difficulty commenced, however, when evacuation started a few days before war broke out. In a week from that time one of the vastest migrations of the modern age had taken place. A number of people, variously estimated at from half a million to three millions, had left London. No one knows exactly how big the figure should be, because it is not possible to measure the extent of the private evacuation of women, children, and business people, but it seems probable that between three-quarters of a million and a million individuals have transferred elsewhere their requirements of cooked food, hot water, warmth, and light.

Simultaneously came the blackout. It not only extinguished the 100,000 street lamps for which these Companies are responsible, but damped down the night life of the city, half closing its hotels, restaurants, and places of entertainment. The blackout also drove families to live their lives in the smallest possible number of rooms, and to do with the least possible illumination, so as to lessen the risk of a descent upon them by the Air Raid Warden.

From the very start, too, long before there was any question of rationing taking effect, the private householder began to ration himself. Instinct told him, and the Chancellor of the Exchequer very soon confirmed it, that he would need to husband his resources, not only for his own sake, but in order to help the country's war effort.

The combined result of all these factors was to cut London's demand for gas to an extent that was simply catastrophic. You probably appreciate that an industry as large and old-established as gas experiences only relatively small fluctuations from year to year, even when marked temperature differences are taken into account. An increase of 1% is normally a matter for rejoicing, while 3% is an enormous increase, representing in the case of these six companies some 2,500 million cu.ft. of gas. This will help you to appreciate what it means when I tell you that in the month of September the London Gas Companies experienced a drop in demand of over 25%. By the time we reached the present month a certain number of people had come back, others had recovered from the shock, and we had reached what I suppose we must learn to regard as our war-time normal—namely, a reduction as compared with last year of between 20 and 25%. We cannot count upon any improvement resulting from the increase of the gas ration from 75 to 100%, since the lower figure had hardly begun to come into operation when the change was announced, and the figures I am giving you are substantially unaffected by any element of restriction on domestic consumers. The temperature has favoured us very much this year as compared with last; otherwise the position would have been worse. It seems probable that we must expect, in average circumstances, a decline in consumption under present conditions nearer 25 than 20% over the area of these six Companies. In quantity this represents about 90 million therms of gas, or some 18,000 million cu.ft.

The Financial Aspect

In order to make clear to you what this means in a financial sense, I am going to take as an instance the position of one Company, the Gas Light and Coke. I can myself speak to you definitely about these figures, since they emanate from my own Company. Moreover, though the circumstances of the six Companies differ in various details, our own position is broadly representative of them all.

The loss of revenue caused by the fall in output of the Gas Light and Coke Company in a full year at present prices would amount to nearly £2,000,000 from gas sales alone, and about £2,500,000 from gas and by-products. On the other side of the account there is, of course, the saving in quantity of coal used and in direct production charges, but with the reduction in coal carbonized goes a reduction in coke produced for sale, so that all we save is the net cost of the coal we do not use and the cost of carbonizing it. As many of you know, the net cost of coal and the direct costs of manufacture on the works are a rather surprisingly small proportion of the total costs of gas supply. In any case, we have made allowances for every possible saving in the costs of manufacture and distribution, both those savings which result from the fall in output and those which can be made by effecting other economies. Unfortunately, all these savings go only a fraction of the way to offset the direct loss in gross revenue, and even so when we have taken credit for them all we are by no means at the end of our story; for quite apart from the drop in output, the war has imposed upon us additional burdens of direct cost which go a long way towards nullifying the effect of such savings in outlay as we can effect.

Take first the question of Civil Defence, which I have already mentioned in its preliminary stages. It is not desirable in the national interest for me to go into detail on this question, but I can tell you that the Gas Companies have been encouraged to prepare themselves to defend and maintain London's gas supply in the event of air raids, and to do so on a basis as comprehensive, and as adequate for any emergency, as the basis which has been adopted for London's public A.R.P. and fire services. The result may from the financial point of view be put in this way. The effect of a 20 to 25% fall in output would ordinarily have been to leave a considerable surplus of men on the distribution, service, maintenance, and inspection staffs. Civil Defence has meant that almost all these men have been retained by the Company as a stand-by force. Even so, this represents by no means the whole of the expenditure that the Company has had to incur on Civil Defence. The total annual burden on the Gas Light and Coke Company accounts from this cause amounts to many hundreds of thousands of pounds.

Transport and Material Costs

Moreover, there have been other serious direct burdens upon our budget resulting from the war. The cost of transport of coal from the north of England to our works is in peace time 2s. 3d. per ton in the Company's own ships. Once again I do not reveal any naval secrets in reminding you that in war conditions the whole procedure of sea transport has been completely altered, with the result that each ton of coal now costs 6s. 9d. in the Company's own ships, and more still in chartered vessels, simply as a result of the changed circumstances of transport, and without taking any account of the much higher cost of insurance of ships and cargoes.

Then again we are paying substantially higher prices for our requirements of a large number of commodities needed for the conduct of our business, and we are compelled to pay heavy insurance premiums on stocks of a number of commodities.

You will appreciate what all these direct wartime burdens mean. They very largely counterbalance such reductions in costs

as might otherwise follow from the fall in output. The reduction in gross earnings, as I mentioned, is about £2,500,000. The reduction in net revenue resulting from the combined effect of all the factors I have indicated would be in a full year well over £1,800,000, which represents more than 2½d. per therm on the flat rate, applied to the reduced sales which we are now making, together with an appropriate increase in the prices charged under tariffs, block rates and special contracts.

These figures apply to the Gas Light and Coke Company, but though the details may differ in the case of the other companies, they all require the same advance in price, and for that reason the Companies have made the decision in common that the published price of their gas must be raised by 2½d. per therm.

I should like to emphasize that in fixing this figure of 2½d. per therm we have based our estimates solely upon losses already incurred, and our estimate of those losses has been a conservative one throughout. There are other adverse factors which we have omitted because of the difficulty in assessing them—such factors as the loss of revenue from gas appliances as distinct from gas itself, which results from the drop in London's population; and again the increase in cost of gas-making consequent upon reduced hours of work through the black-out. Moreover, there are other factors which have not yet begun to take effect, but which in one form or another almost certainly will. For instance, our present estimate is based on the reduction of output that has already been experienced—namely 20% in the case of some Companies, and a little more in others, but, as I have already mentioned, temperature since the war has so far been colder than last year, and has thus helped us. In average circumstances the drop in our sales might very well be rather larger. Almost every factor at which one looks, whether it is commodity prices, or rates and taxes, or any other, contains the possibility of some further increase of cost. None of this has been taken into account.

Shareholders and Consumers

Exactly how we shall provide for the combined effect that these various factors may produce is a matter that must be left to the future to decide. Obviously, however, it would not be fair or appropriate that these burdens should be borne by the gas consuming public alone. I cannot forecast the future in any detailed way at a time of abnormal uncertainty, several months before the Gas Companies' accounts are made up, but I can say quite definitely that in the case of all Companies here represented dividends for the current year must be reduced.

The position of the shareholders as I see it is this. In the long run it is essential in their interests, just as it is essential in the interests of gas consumers, that steps should be taken to enable the production and supply of gas to go on on a sound basis, and not on a basis of heavy loss, which would inevitably lead to bankruptcy, the decline of assets, a reduction in efficiency, and the disintegration of the Industry. In that sense, therefore, the step that we are now forced to take is necessary in the interests of shareholders and consumers alike. The short-term effects may be unpleasant for both, but drastic remedies are sometimes the only possible ones.

Now I would like to say one final word to the gas users of London. I will not waste words in assuring them that this increase is imposed with the greatest reluctance and regret. They probably realize for themselves that when a great public service has spent years in improving the quality and increasing the extent of its work for the public, it must be a most acute disappointment to those in charge when they are forced by grim necessity to take a step which even temporarily tends to interfere with the public's free use of that service. My colleagues and I are quite well aware, moreover, that this decision must cause hardship in some cases. If there were any way to avoid it, or to lessen it, that way would have been taken. The increase is a big one and, as I have explained, a great part of it is due to the special circumstance that London is not only an evacuation area but has lost a bigger share of its population than anywhere else in the country. The war has hit us all, wherever we live, but the burden it lays upon those in evacuation areas is of special severity. Their risks are greater, their anxieties are greater, many of them have had to submit to the temporary break-up of family life, while reductions in transport and other facilities and amenities cause them particular inconvenience. They are, therefore, already accustomed to the special disabilities of living in a great city in war time and will the more readily understand that this new burden on their budgets may, like other war time burdens, hit London and possibly other evacuation areas, harder than it will hit householders fortunate enough to live in the neutral or reception districts.

Moreover, we can all of us take some small comfort from the fact that all these ill effects of war on our homes and businesses will come to an end sometime, whether sooner or later. There is absolutely nothing in the inherent situation of the Industry to cause dismay. Very much the contrary. Had it not been for the war the Gas Light and Coke Company would in 1939 have exceeded by a considerable margin the previous largest year's sale in its history, with no particular help from temperature conditions. The possible applications of gas to domestic, commercial, and industrial purposes were developing in many hopeful directions. None of this good work will be lost; none of these possibilities will be finally lost; once peace returns the Industry will reap the fruit of them all. Moreover, the sharp reminder which the war has brought of the country's dependence in an emergency on the Industry, both from the aspect of fuel conservation and of the production of by-products vital in war, should have the effect of securing still more firmly the Industry's claim on the goodwill of the State. The long-term outlook is as bright as one could wish. Let us not lose sight of that fact in the concern which we all must feel about the necessities of the present dark hour.

Gas Undertakings Results

Adelaide

The accounts of the South Australian Gas Company, whose headquarters are in Adelaide, for the year to June 30 last, show a profit after paying interest on bonds and adding the balance of £18,938 brought forward from the previous year, amounting to £135,450. The payment of a dividend of 5% for the year, and the transfer of the sum of £45,013 2s. 1d. to the Special Purposes Fund, leaves a balance to be carried forward of £20,437.

Brisbane

While sales generally during the half-year to June 30 increased satisfactorily over those of the corresponding six months of 1938, the Brisbane Gas Company experienced such a heavy rise in expenditure, owing to the increased cost of coal, rail transport, basic wage, and taxation, that the result is a reduced balance for appropriation. In order to pay the 3½% dividend recommended, it has been necessary to draw £3,530 from reserve. There has been a constant demand for a supply of gas to new premises, and main extensions have been carried out in many streets. Arrangements have been made with West's Gas Improvement Company, Ltd., of Sydney, for the re-construction of two settings of vertical retorts. The number of consumers increased by 722 during the six months, making the total number supplied at June 30, 33,209. Despite competition, gas continues to be a popular medium for cooking, and during the half-year the Company received applications for supply to 761 additional cookers. The demand for gas for other purposes is also increasing.

Dumbarton

The accounts of the Dumbarton Town Council Gas Department for the year to May 15 last show that the quantity of gas made was 258,387,000 cu.ft., which compares with a make of 229,145,000 cu.ft. in the preceding twelve months. The revenue from sales of gas was £27,005, as against £24,941; and from residuals, £11,777, against £10,707. In the past year £1,660 was received for gas supplied for public lighting. Of total receipts amounting to £41,188, the sum of £5,437 is carried to Net Revenue Account, while total payments on this account come to £6,029. The balance in hand at the beginning of the year has been reduced from £4,892 to £4,300, making the debit balance for the year £592.

Greenock

The quantity of gas delivered and accounted for during the year to May 15 by the Burgh of Greenock Gas Department was 791,442,900 cu.ft., which compares with 773,359,300 cu.ft. in the preceding twelve months, an increase of 18,083,600 cu.ft. or 2.3%. Of a total of 19,783 consumers, 12,931 took their supply through prepayment meters, from which practically 101 tons of coppers were collected. Gas appliances in use increased by 1,825 during the year, to a total of 38,740—the population in the area remaining stationary at 80,000. Out of a gross revenue of £112,323, a balance of £12,801 remained to be carried to Net Revenue Account, and a sum of £7,845 was brought forward from the previous year. Contributions of £2,000 to the Rate Fund and £5,000 to Reserve Fund, together with standing charges totalling £13,500, leave a credit balance of £146 in Net Revenue Account. Over the last nineteen years, a total of £16,000 has been contributed to the Rate Fund from Gas Department profits. In the past year the average cost of coal, at nearly 23s. per ton, was 9s. per ton over the 1914 price, and necessitated an increase in the price of gas. A graded increase to bring in additional revenue equal to 0.73d. per therm (3d. per 1,000 cu.ft.) was recommended, and is now in force. This increase will bring the price almost up to the 1914 level,—*i.e.*, 2s. 4.96d. per 1,000 cu.ft.

Problems Which Deserve Consideration

by

COLONEL W. A. BRISTOW, M.I.E.E., F.R.A.S.

Vice-President of the Institute of Fuel

Address on being installed as President of the Fuel Luncheon Club

AS we are at war, and already have been brought up rather sharply against several hard facts, it may be a fitting opportunity to review some of the basic factors in the situation which deserve and in fact demand our earnest consideration. I propose, therefore, to survey quite briefly some of the problems which already are indicated. Firstly, there are those cases in respect to which we are now beginning to realize how much better off we should be if we had applied ourselves in peace time to the manufacture in this country of some of the materials which play such an important part in our fuel and heavy industries.

Before dealing with the products which we do not manufacture here, I would like to mention briefly some new aspects of an old question which has been so often discussed in the past. The war has focused attention once more upon the vital importance of oil. We should, I submit, be extremely grateful to the leaders of the oil industry for their enterprise, foresight, and devotion to the interests of this country, which has placed us in the satisfactory position in which we find ourselves to-day. The task of preparing for war has been immense and extremely difficult, and it has only been possible to bring it to its present stage by a spirit of unselfish co-operation. Naturally there are all sorts of details arising out of the working of this new machine which cause dissatisfaction and grumbling, but that must not cause us to lose sight of the fact that a great work has been, and is being, done, without which we should have been in a very different position.

One effect of the war, however, has been to raise the question of which is the right policy in peace time—to import crude and refine here, or import the finished products. The problem is twofold, the oil production aspect is one and the other the necessity of reducing the unfavourable balance of trade in peace time and giving employment, and of safe-guarding sterling as much as possible in war.

In 1938, our oil imports were divided roughly as to 80% refined products and 20% crude, the values being 2.2d. and 3.7d. per gallon respectively.

Of these imports, which together totalled 3,208 million gallons and cost over £46,000,000, only 8% in value came from Empire countries. There would, therefore, be a considerable saving in foreign currency if a greater proportion of the country's oil requirements were imported in the form of crude. According to some very informative statistics recently prepared by Dr. Kind, there would be a saving in foreign currency of nearly £2 per ton on the basis of 1938 prices and a much greater saving this year, both before and after the outbreak of war.

Most of the material required in the construction of refineries can be obtained in this country and modern plants can operate on almost any grade of crude oil and produce up to 97 gallons of finished refined products from 100 gallons of crude oil.

It is interesting to note that in France in 1929 the crude oil imports were only 5.6% of the total, as against 85.8% in 1938, and the importation of refined products fell during the same period from 94% to 14%.

In Italy also in the same nine years the crude imported increased from 4.6% to 57.6% of the whole.

These are most striking figures indicating clearly what enormous strides have been made in the refining industries in those countries in the last 10 years.

Another advantage in having home refineries is due to the fact that the products provide the raw material in the shape of gases and intermediate products for high octane petrol, toluene, and many other valuable chemical products, and this utilization of refinery by-products has become in the U.S.A. a most important and profitable business.

Manufacture of Calcium Carbide

Let us next look at the question of the manufacture of calcium carbide, of which there is no production in this country. The imports in 1938 totalled approximately 65,000 tons, of which 35,000 tons came from Norway. Had this tonnage been made here it would have necessitated the consumption of 68,500 tons of calcium oxide, 52,000 tons of low or high temperature coke or anthracite, and 163,000 tons of steam coal, in addition to sundry other materials. The establishment of the carbide industry here, important though it is in itself, would stimulate other industries for which it would provide the raw materials. For example, the production of cyanamide, which is made by combining carbide with nitrogen at high temperatures. Cyanamide is not only a high grade fertilizer, but is also in turn a raw material for ammonia, nitric acid, and ammonium nitrate, the latter being required both as a fertilizer and for the explosives industry. In addition, there is the very important group of chemical industries based upon acetylene. One of the most important derivatives is acetaldehyde which can be converted quite easily into alcohol, acetic acid, acetone, and rubber. For this latter product acetylene is in America converted into vinyle compounds, or in Germany into butadiene from which their buna rubber is manufactured. The four chief factories in Germany should, if allowed by the course of events, produce in 1940 no less than 75,000 tons of buna rubber.

These compounds are also a raw material for several varieties of plastics, and for special varnishes of industrial importance. These are only some of the processes and products resulting from the carbide industry, and its size and significance may perhaps be envisaged from the fact that the American Union Carbide and Carbon Corporation, which bases its chemical production mainly on carbide, made in 1936 a net profit of 34,000,000 dollars, and operates in the United States and Canada more than 160 factories.

Another electro-thermal process similar to the carbide process is the manufacture of ferro-silicon which is an essential raw material for the steel industry, and in 1937 we imported 23,804 tons mostly from Sweden. More than half this quantity consisted of only 50% silicon, but had we been making it here and utilizing our own low temperature cokes, we could easily have produced a much higher grade even up to 90%. In Germany they are already working a ferro-silicon plant in conjunction with a low-temperature plant for the manufacture of high-grade silicons.

The manufacture of carbide and ferro-silicon can be carried out in the same plant for an addition of only 30% on the capital cost, most of the plant being equally suitable for both products. This would enable the cost of production to be materially reduced in each case and if the plant were operated in conjunction with a suitable low-temperature carbonization plant, the overall economy would be still further increased.

Synthetic Processes

Another and more important branch of the fuel industry which we might have attacked on a large scale is that known by the generic term synthesis. Efforts were made in this country to enlist Government support for a full-scale trial of the Fischer-Tropsch process, but without success. As you are aware, by this process hydrocarbons are produced

by the synthesis of hydrogen and carbon monoxide, and the whole of the original coal is converted, after being coked, into liquid fuels and valuable gases. Germany produces to-day at the rate of 500,000 tons per annum of petrol, Diesel oil, and paraffins by this process, and consumes the equivalent of about 2½ million tons of coke. The latest plant of Krupps is operated on low-temperature coke which has been found best for the conversion, owing to its reactivity in the water gas process. The Germans have two main objects in view in the development of this work, firstly the production of a very high-grade Diesel oil with a cetene number of 120, or of a low octane petrol which can be improved by other means, and secondly, the establishment of a new industry utilizing the aliphatic compounds. For example, the fractions rich in olefines are already used for the manufacture of lubricating oil while the paraffins are oxidized into fatty acids which are used in the manufacture of soaps or converted into glycerine. Remembering that nitric acid is being made by the combustion of ammonia produced from coke oven or water gas, it can be seen that nitro-glycerine can now be produced from coal alone, as is also the case with ammonium nitrate and trinitro-toluole.

It is also important to remember that synthesis is not restricted merely to making oil. At higher pressures and with other catalysts carbon-monoxide and hydrogen combine to form methyl-alcohol, which is the chief raw material for formaldehyde. This latter, as you know, is the indispensable reagent in the manufacture of plastics. It is also important to remember that other constituents of a large group of plastics are derived from coal in the form of phenols and cresols. The field for the future utilization of coal along these lines is immense, and many branches are still open for exploitation in this country.

Up to the present I have confined my remarks to processes and products that are already commercially established on a large scale in other countries, but, in my opinion, the work that is now being carried out on these lines will inevitably lead to new developments of the most remarkable character and offering new and immense possibilities to the coal industry. For example, during the past few years the production of high octane petrol by polymerization has become vitally important.

It is not too much to say that, other things being equal in rival air forces, the power of attack and defence will depend upon the unstinted supply of high octane petrol. It is certain that within limits not yet reached the performance in respect of speed, rate of climb, military load, and striking range is increased in a remarkable degree as petrol of higher octane number is made available.

These facts are, of course, common knowledge, but what is not so generally known is that these high octane petrols can be produced from coal via synthetic processes. Even to-day the Fischer process, for example, can be carried out in such a manner as to produce large quantities of mono-olefines. It will be merely a question of time and research to produce, by gas synthesis, gases rich enough in olefines to be polymerized into petrol. It is known that polymer petrol possesses a very high octane number, anywhere between 80 and 90, but it can under certain conditions reach 100, as in the manufacture of iso-octane from iso-butylene or iso-butane.

The British Navy ensures the defence of this country from attack by sea for reasons that are well known to you all, but the future mastery of the air will fall to that nation that will and can manufacture this fuel and design engines and aircraft to use it to the fullest extent of its possibilities. And in this country, which has no oil at all, it is at all events comforting to think that it could be made from coal.

Another revolution will be accomplished if the conversion of methane itself and its homologues into olefines can be carried out commercially. This is a problem of great importance both for the oil and the coal industries. For the oil industry because of the immense quantities of methane contained in natural gas, for the coal industry because of the high percentage of methane in the gases from carbonization.

To give you an idea of the quantities available, I may mention that in this country five low-temperature plants alone yield when in full production at least 25 million cu.ft. of methane per week. In addition, unlimited quantities of methane could be produced synthetically by the hydrogenation of coal with hydrogen or even steam at high pressures. The conversion of methane and the polymerization of the conversion products into high octane petrols is the point towards which I hope we may see the coal and oil industries converge.

A Tribute to I.C.I.

After a rather dismal survey of the things we do not do, it is refreshing to pay a tribute to the fine work done by the I.C.I. at Billingham on the hydrogenation of coal and coal oils. Single handed and despite many disadvantages they have raised the process to a high state of efficiency which compares more than favourably with anything done in Germany. Unfortunately, however, the capacity at Billingham is, I believe, only about 150,000 tons of petrol per year, while the German plants now have a total capacity of 1,600,000 tons per year. It is interesting to note that about half the German total is derived from the hydrogenation of low-temperature oil, while the low-temperature coke is used in water gas producers for making the hydrogen.

It is, I think, clear that we must embark upon a full scale wide fronted attack upon these many problems if we are to maintain our place in the world. In planning this attack, we should also not forget that in other parts of the Empire there are already valuable facilities for undertaking some of the work I have outlined and I think we should not overlook these possibilities. These things are not matters of test tubes, but of human destinies, and with our heavy and continuous adverse balance of trade, we cannot afford to waste even a year before tackling these great tasks.

What is it that stands in the way? Certainly not lack of skill, knowledge, or courage. I think the system is to blame. We have no co-ordinated constructiveness in the fuel and chemical industries. We all shovel hard in our own ditches and only occasionally look over the top to see what our nearest competitor is doing. We have no Ministry of Heat, Light, and Power which should be the greatest and best equipped Ministry in the country, and there is almost complete absence of national planning by the many sections of the industry. Another powerful deterrent to progress is the financial system by which industry is operated. Nearly all the large concerns are limited companies run by Boards of Directors who in turn are slaves of the financial whip-crackers who ceaselessly remind them, quite properly, of next year's balance sheet and the rate of dividend expected. I cannot envisage the chairman of any of our large companies competent to embark upon some of this work standing up before his shareholders and explaining that there was no dividend for them as they had spent all their profits on experimenting with the methane molecule in the national interest. No! I feel sure it cannot be left to chance and the occasional advances of lone adventurers, that way would leave us hopelessly in the rear. The State provides the Army, Navy, and Air Force for our national preservation, to which we all have to contribute according to our imaginary ability. It is now also necessary in my opinion for the State to establish a Commercial Research Force, not only to undertake pure research and experimental work, but also to operate plants of ample capacity in order that these processes can be brought to fruition. If these things are, as many of us believe, of vital importance to the future of this country and the Empire, then it is only logical that each should pay according to his ability as in the case of the other National Services.

Need for Immediate Action.

There are additional and most weighty reasons that should compel us to embark upon some of this work without delay. We have been late in preparing for this war because so many of us believed that nobody could be as insane as to make fresh wars in Europe for the sake of "One man's senseless ambition" as Mr. Chamberlain has tersely put it. We were wrong, and now we have to work night and day to make up for lost time. Let us take warning from that and begin to work *now* for winning the peace. When our hundreds of thousands of young men return victorious from the war, what shall we have ready for them? Are we now to plan for peace as we now plan for war, or are we going to be content to leave it to chance and luck as to whether they are going to be given a new start in life, or decay morally and physically on the dole as long as we are able to pay it, which incidentally might not be very long?

What happened after the last war? The collieries which

had played such an important part in the Allied victory were left to their fate and in 1926 the country was brought to the verge of revolution. As a result of subsidies, of voluntary increases in contract prices, and the Mines Act chaos and bankruptcy were narrowly averted. But what is going to happen after this war? I cannot see that it is going to leave the coal industry any better off than it was after the last, and as we all know it suffered almost more than any other industry. And none of us sitting here can do anything to help it. We shall all be animated with the keenest possible desire to do all we can in our own limited spheres, but we shall all have to wait for the miracle of returning prosperity to bring our hopes and desires to fruition. And what chance will there be of prosperity unless we plan for it and lay the foundations now? Immense taxation, colossal fall in national revenue, impoverished foreign markets, a crushing adverse balance of trade, and no spare capital left.

Much of the work I have described has been carried out in Germany to prepare for war. Is it too much to ask that in this country we should show similar commercial courage and resolution in order to prepare for peace? I suggest that it is essential that at the end of this war the national effort directed by the Government shall continue unabated in order that we may be as victorious in peace as in war, and that we plan finance and commence that great effort now. We cannot leave the fate of our returning armies to luck, and we must safeguard the future of the coal, oil, and allied industries of this country.

And unless we do that we shall lose the war no matter how thoroughly we may have obliterated Hitlerism in the field.

Unaccounted-for Gas

Summarized Report of a Discussion at Cardiff on Oct. 26, by the Wales and Monmouthshire Association of Gas Engineers and Managers. The Paper, by Mr. C. B. Felton (Engineer to the Ludlow Union Gas Company, Ltd.), will be found in the "Journal" dated Sept. 27, pp. 713-14.

The **President** (Mr. J. Prosser Jones), in inviting comments from the members, remarked that the Author's subject was a highly intriguing one.

Mr. H. T. Gilbert (Cardiff) said that Mr. Boardman very much regretted his inability to be present at the meeting, and had asked him to say a few words on the Paper. In the first place, they desired to congratulate Mr. Felton upon it, but at the same time it must be borne in mind that a Pipes Committee met regularly in London to investigate some of the matters bearing on the title of the Paper. For instance, quite a lot of investigation had been carried out on the question of cast steel, and wrought iron pipes, as well as the corrosion of service pipes and bends, which points had been gone into under the chairmanship of Mr. Escreet. It was, he thought, quite agreed that the Mains Superintendent's responsibility for unaccounted-for gas should be shared by other departments.

Experience in Cardiff

With regard to spun pipes, mechanical joints, and other modern innovations, he wondered whether their reliability had yet been properly proved—especially in view of their experience of more than a century's working of cast-iron pipes with run lead joints. In Cardiff they had lately taken out cast-iron pipes which had been in the ground for over 70 years, and a sample was in the room to demonstrate their condition. As opposed to this, a 12-in. steel main put in during 1921 developed grave faults within five years, and 1,000 yards had to be examined, and numerous protective clips fitted. He mentioned this because, although it had an excellent specification for a steel main, its life depended upon the nature of the soil. In the same roadway there was a 24-in. cast-iron main, lead jointed, laid in 1897, which to-day was in as good a condition as when put in.

So far as unaccounted-for gas in Cardiff was concerned, the average for the past ten years was under 4%, and they imagined that the proportion of this from leaky joints was negligible. The bulk of the mains were cast iron with lead joints. Records showed that over the same period the leaky joints had averaged only one per annum in each 6,000 yards of main. In the opinion of his Company, the question of leaky lead joints depended a great deal upon the reliability of the men making the joints, and proper supervision. A point of importance in connexion with unaccounted-for gas was the examination of pipes and services uncovered by other authorities. In Cardiff the Company employed inspectors whose duty it was to examine the pipes under these conditions; the average number of service pipes examined being over 1,000 per annum. A careful record was kept of any defective pipes, and any necessary repairs or renewals were carried out immediately. It must be remembered that, once pipes and services were buried, their condition was very often unknown until a defect showed itself by an escape of gas, and it was essential, as Mr. Felton had observed, that every care should be taken, not only to lay mains well, but to deal with firms of repute, whose material could be depended upon.

Two Points to Consider

Mr. W. Clark Jackson (Neath) remarked that they all knew to their cost what neglect might lead to so far as main laying work was concerned, and therefore, a paper of this description was always opportune. Young engineers, while very keen on the works, were sometimes not quite so keen on the district. There were just two points which he would like to make. Towards the end of the last war, the question of unaccounted-for gas gave a good deal of trouble to many undertakings, and it would be within the memory of many of those present that much of this was traced as far back as the meters. There was no Gas Regulation Act then, and they were not quite so scientific in their outlook. He was glad that they had advanced since then, because he felt that during the last war conditions on the production side were sometimes not quite what they might have been, and gas containing excess oxygen had a great effect upon the meters at that time. He hoped, also, that the meter manufacturers would be very careful regarding the skins they used, and that if they were not in a position to get the same quality as pre-war they would make every effort to find a substitute which would stand up better to the work than was the case during the last war.

His other point was with regard to services. A chain was only as strong as its weakest link, and no matter what trouble they took to get good quality pipes, properly coated and wrapped, if care was not taken to see that the screwed ends were also carefully wrapped after connecting-up, they would have the weak link in the chain, and would be making trouble for the future.

Mr. W. H. Johns (Swansea) said he was now engaged in preparing plans for laying something like 8 miles of 8-in. steel tubes, which were necessary for the heavy pressure that would have to be carried. He knew cast iron had a very good life, but there were cases in which one had to lay steel mains, and he was faced with this position. He was not going to depend upon any particular patented joint. Speaking personally, he had had no experience of them, and he wondered whether the Author had found them all they were said to be. In view of the fact that it was found necessary to introduce a patent leak testing appliance for testing these particular joints, he had still to be convinced that they constituted the best method of joint making.

A Test at Newport

Mr. J. F. Rust (Newport) stated that when Mr. Felton was at Newport, he was responsible for the laying of 10½ miles of 12-in cast-iron main, with patent joints, from the coke ovens to Newport. Some nine months after the completion of the main, it was found necessary to ask the coke oven people to cease sending gas through the main while an exchange heater was being fitted to the purifiers at the Newport Gas-Works. It was decided that during this shut-down period they should avail themselves of the opportunity to carry out a test of the main. It was therefore pumped up with gas to 7½ lb. per sq.in., and three mercury gauges and two recording gauges were installed to record the pressure. After 9½ hours, the gauges

showed no variation, except that during the afternoon the recording gauges were inclined to rise slightly. The only explanation of this which could be offered was that during the afternoon a burst of sunshine made a recording thermometer rise some 6°, and that the main in question was exposed to the extent of some 250 yards, where it crossed railway bridges.

Mr. H. Butterworth (Manchester) referred to what Mr. Jackson had said regarding the time when low-grade calorific value gas was going forward, and meter manufacturers were unable to get Persian skins, so that English sheep skins had to be put in instead. The substitutes introduced could not, of course, be expected to last as long as the standard article, but the fact that the gas was "stretched" during that war period had a tendency to affect the dressing of the diaphragms. Research work had followed which had undoubtedly led to more protective methods for withstanding changed conditions in gas manufacture. There was no question but that the presence of oxygen and moisture in the gas had a tendency to cause oxidation of certain of the tinned parts, which would result in oxide of iron forming on the diaphragm itself. This and the stripping of the leather of its dressing, tended to powder the skin and make it porous.

Col. W. M. Carr (Managing Director of the United Kingdom Gas Corporation) remarked that this was the kind of discussion which was almost invaluable. The Paper brought to their consideration one of the most important problems with which they had to deal. There was no work which yielded a more satisfactory result, or which gave a better financial return, than that which was devoted to keeping down the unaccounted-for gas. One or two very interesting points had been raised in the discussion. Mention had been made by one speaker of the fact that cast-iron pipes with ordinary socket and spigot joints had been used for a great many years with almost complete success. There were, however, as Mr. Felton had stated in his Paper, undertakings in colliery districts, subject to frequent subsidences, and they needed special consideration. This was a matter in which he was particularly interested, from the point of view that he was concerned with a large gas grid in Yorkshire, where it had been necessary to lay within a very short space of time between 50 and 60 miles of main, ranging from 18-in. to 10-in., in cast iron with mechanical joints, to withstand a pressure of 30 lb. per sq.in. Naturally they did not embark on this work without very careful previous investigation.

Expert Welding

The welded steel main was, continued Col. Carr, an excellent job, but it had the disadvantage that it was essential that each joint should be made by an expert welder. The difficulty was to find a sufficient number of expert welders. Provided the supply of expert welders was fully adequate to meet requirements, he was certainly not going to say that they would not make an excellent job; but he was also satisfied that a mechanical joint in a cast-iron main was extraordinarily good from the point of view of maintaining pressure, even under conditions of considerable movement. A large number of tests were carried out, in which they put a length of main under a pressure of 60 lb. per sq.in., with considerable movement; and as a result of these tests, they felt satisfied that the mechanical joint was perhaps the best solution of the problem they had to face. It had the advantage, too, that, while it was important that the main layers responsible should thoroughly understand the joint, yet it was easier to instruct men to apply that joint than it was to find a sufficient number of expert welders to deal with a job of such big dimensions. The Paper was an example of good thinking on the part of gas engineers.

Largely a Question of Book-Keeping

Mr. George Dixon (President of The Institution of Gas Engineers) remarked that there were present in the hall a number of young men who were actually engaged in the operations which were being discussed, and it would have been helpful to hear from them. The Author had referred to the Interim Report of the Sub-Committee of the Institution formed to investigate this question, but he (Mr. Dixon) felt the Paper before the meeting was of infinitely more value to them immediately than any consideration of the matter in London. There seemed in London to be some feeling that there was a loss of dignity on the part of undertakings which might show 6% or 7% of unaccounted-for gas, as against other undertakings which might show perhaps a figure in the region of 0%. But really it was to a large extent a question of book-keeping. If a man showing 10% brought it down to 1% by calling the balance something else, he would not help his Revenue Account, and what they were really concerned with was the actual profit they were going to make. There should be a distinction drawn between the work done by The Institution of Gas Engineers and a Paper such as was being considered that day.

It was arranged that the Author should prepare a written reply to the discussion.

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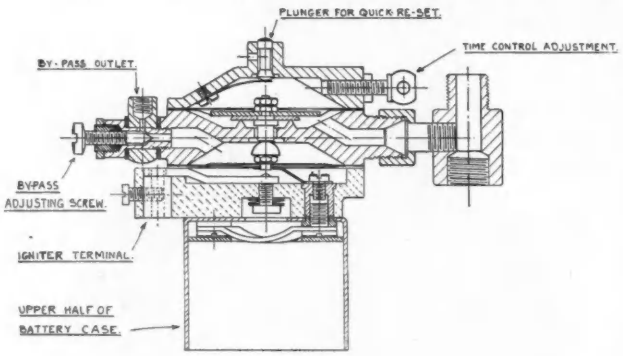
GAS STREET LIGHTING CONTROL

In response to several requests from readers for information on Gas Street Lighting Control Equipment, of which much has been developed and is available to the Gas Industry, we publish the following notes as a preliminary to further descriptions.

FIRST of all, a description of the Newbridge "Comet"—a highly successful device developed by the Horstmann Gear Co., Ltd. This has been on the market for some little time, and reference has already been made to it in the "JOURNAL." Fuller information will, however, be of interest and service. The "Comet" is an automatic pressure-operated electro-catalytic device for effecting ignition of the burners of gas lamps, thus dispensing with the need for continually burning pilot jets.

It consists of (a) the "Comet" body mounted on a bakelite base, (b) a chromium plated battery case (containing a 1½ volt



SECTION OF MARK III COMET BODY.

dry battery) attached to the underside of the bakelite base, and (c) an igniter, comprising by-pass tube, twin wire cable, and head.

The body of the device is a brass hot pressing, divided laterally by a web. Above and below this web are leather diaphragms; from the upper a brass mushroom valve is suspended, the stem of which passes through an aperture in the web. To the underside of the lower diaphragm is attached a brass plate. Above the upper diaphragm is a dome-shaped air chamber.

Attached to the body is a banjo union incorporating a by-pass adjuster, to which is connected the by-pass tube of the igniter. The twin cable of the igniter is attached to terminals in the bakelite base of the body.

When gas is admitted to the "Comet" it passes below the upper diaphragm, through the aperture in the web into the lower chamber, and thence into the by-pass tube to the igniter head. The rate of gas exit being less than that of entry, pressure is immediately set up which depresses the lower diaphragm, bringing the brass plate attached thereto into contact with a terminal in the bakelite base, completing the circuit and causing the platinum alloy filament in the head to glow, thus igniting the gas at the head. At the same time the upper diaphragm is rising, until the mushroom valve is engaged in its seating in the web, thus cutting off the supply of gas to the igniter head; when the gas in the lower chamber is consumed the pressure on the lower diaphragm is relaxed, allowing it to rise, while at the same time the brass contact plate rises, breaking contact.

The speed at which the upper diaphragm rises (and, therefore the quantity of gas allowed to enter the "Comet," and consequently the length of time during which the pilot flame burns) is governed by the escape of air from the dome shaped air chamber, which is regulated by a time control screw.

While the lamp is alight the upper diaphragm and the mushroom valve are kept in position by the pressure of gas. When the lamp is extinguished this pressure is released, allowing the diaphragm and valve to return by gravity to their original positions, ready for the next lighting operation. The device will operate successfully over a wide range of pressures, with a standard minimum of 20/10ths w.g.

When set to give a pilot flame of five seconds duration, the amount of gas used by the "Comet" (assuming one lighting operation daily) is less than 1 cu.ft. per annum. This description relates to the Mark III "Comet" for use in square lanterns.

For suspension lamps the Newbridge Type 15/3A/COM. controller is usually employed. This incorporates the controller mechanism, "Comet" body, and twin cell 3-volt battery in one case, the pilot tube and cable being carried down outside the lamp, entry into the latter being effected in the case of new lamps by a special spout fitting supplied by the lamp makers and in the case of lamps already in use by a notch cut in the globe ring of the lamp.

THE NEWBRIDGE AIR RAID VALVE

More recently we have had the Newbridge air raid valve, also developed by the Horstmann Gear Company—a valve designed to enable public gas lamps to be extinguished promptly. This valve is operable by a pre-determined increase or decrease in

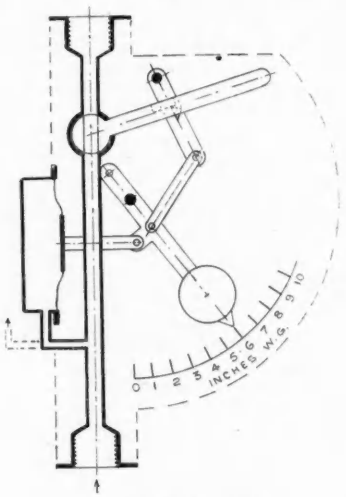


Diagram 1.—Valve open.

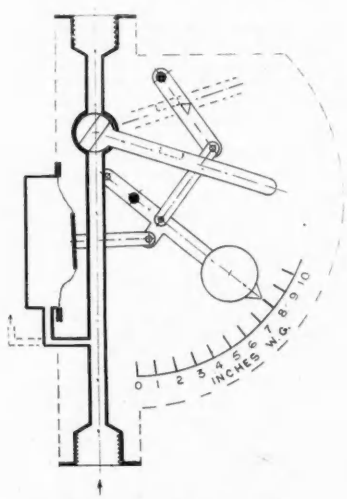


Diagram 2.—Valve closed.

mains pressure—whichever is demanded by the exigencies of local conditions or preference—above or below the normal working pressure, and can be adapted on site to function accordingly. The valve must, however, be pre-set to the pressure at which it is desired to extinguish the lamp. If it is set to operate on a

decrease in pressure it will not function when the pressure is increased or vice versa.

There is a marked difference between the Newbridge air raid valve and a pressure wave controller. Relighting can only be effected manually, thus preventing the lamps being relighted by an inadvertent, or malicious, alteration in pressure. The air raid valve can also be shut off by hand should the necessity arise.

In addition to these precautionary features, the calibrations which are provided on the valve eliminate the necessity of a pressure gauge for setting the device, as the pressure is clearly indicated by a pointer in inches w.g.

It should be added that owing to slight variations in the behaviour of small leather diaphragms the Newbridge air raid

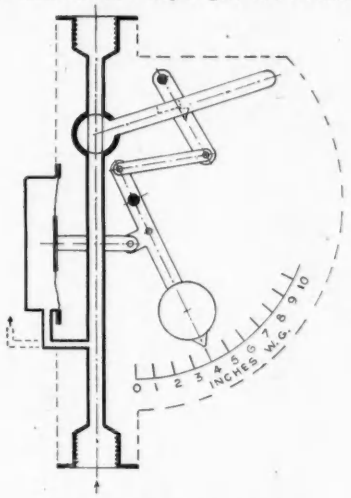


Diagram 3. Valve Open.

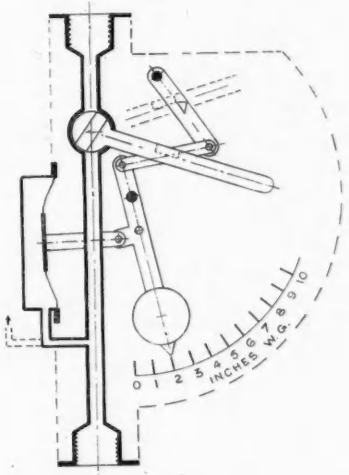


Diagram 4. Valve Closed.

valve is not intended or claimed to record or operate at dead beat pressure but that variations of about plus or minus 1½/10ths water gauge must be allowed for under working conditions.

Construction

The valve and operating mechanism are housed in a die cast aluminium case, a removable cover providing access to the mechanism. Inlet and outlet connexions are tapped ½ in. gas barrel size. The essential principles of the mechanism are as follows: A rotary gas plug is spring loaded to the "Off" position and is manually operable by an outside lever, which may be fitted with chains if necessary. The rotary gas valve is provided with a catch, which, in conjunction with a corresponding catch on the releasing mechanism, enables the spring loaded gas valve to be retained in the "On" position.

A heavy pendulum hung on sensitive bearings is connected by a link to a flexible diaphragm which forms one wall of a pressure chamber. The pressure chamber is connected to the inlet of the gas supply by a small duct. Any gas pressure present in the pressure chamber pushes the pendulum

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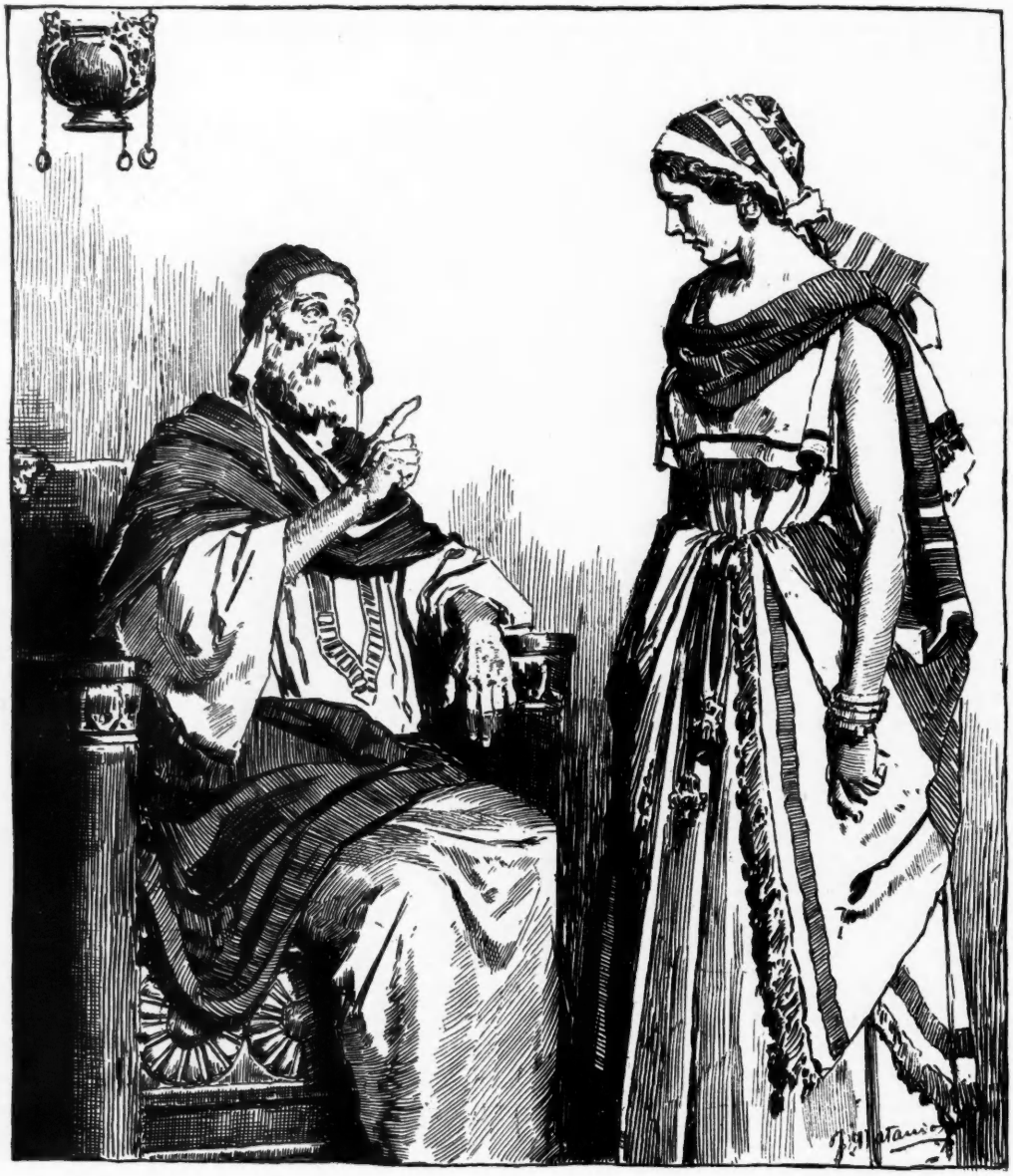

THERE was in ancient times a certain wise man and unto him came many people in need of advice, and to all he offered council on the how and why of things.

One day there came a young woman whose husband had complained that while she spent much she got little in return, and the wise one told her, "That which is bought or sold has no value unless it has that which cannot be bought or sold. If you would get most for what you spend, look for the priceless quality."

"But what is this priceless quality?" asked the young woman.

And the wise one answered, "My daughter, the priceless quality in any product is the honour and integrity of him who makes it. Consider his name before you buy."

As modern as to-morrow, but with the knowledge and experience of 147 years, we specialise in the manufacture of Blast Furnace Plant, Gas Works Plant, Steel Works Plant, General Chemical Plant, Benzole Plant, By-Product Plant, Cast Iron Tanks, Steel Tanks, Coke Oven Machinery, Pig Iron, Excavators, General Castings for the various trades and all forms of Light Castings.

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from its natural vertical position to an angle dependent on the extent of the pressure. The actual gas pressure present is indicated by a pointer on the calibrated scale.

The pendulum is connected by another link to the retaining catch of the gas plug, and the whole mechanism is easily adjustable so that the spring loaded gas valve is released when the pressure indicates any pre-determined pressure on the scale.

Extinguishing Lamps by an Increase in Gas Pressure

Let it be supposed that the Newbridge air raid valve is fitted on a district where the normal working pressure is 6 in. w.g. and that it is desired to extinguish public gas lamps by increasing the pressure to over 8 in. w.g. Diagram 1 indicates the valve fitted on a lamp where the normal working pressure is 6 in. w.g. It will be apparent that once the gas valve has been manually opened it will remain open at any working pressure up to but not in excess of 8 in. When it is desired to extinguish the public lamps the gas pressure would have to be increased to over 8 in. w.g. for a short period. As soon as the pressure exceeds 8 in. the diaphragm having forced the pendulum over until the pointer passes 8 in. on the scale, the retaining catch to the spring loaded gas valve will be released, and the lamp extinguished. See diagram No. 2.

Extinguishing Lamps by a Decrease in Gas Pressure

Should it be desired to operate the valve and consequently extinguish the lamps by a decrease in the pressure, the valve would be altered to function accordingly, say from a working pressure of 4 in. w.g. to extinguish when the pressure drops to 2 in. w.g. (or under)—see Diagram 3. This change-over can easily be effected in situ. Once the valve has been manually opened, it will remain open at any pressure above 2 in. w.g., but as soon as the pressure drops below 2 in. w.g. and the pressure on the diaphragm is reduced the pendulum will swing towards the vertical until it has passed the calibration indicating 2 in. w.g. pressure on the scale, when the retaining catch to the spring loaded gas valve would be released and the lamp extinguished—see Diagram 4.

The valve possesses the advantage of indicating the pressure existing in the mains at its particular location and each valve may be readily set to extinguish its own lamp at a suitable predetermined pressure. This is an advantage where pressures vary over a district. The valves may also be readily pre-set to operate at any pre-determined pressure without recourse to pressure tests.

The standard valve provides operations over a pressure range up to 10 in. water gauge.

Both the "Comet" ignition device and the air-raid valves are fully patented.

Trade News

Aids to "Emergency" Gas Heating

Low-consumption space heaters which ensure the gas consumer a full measure of effective heating in war-time are the subject of a folder just issued by R. and A. Main, Ltd.

The "Glowmain" Heater.

It includes the portable "Glowmain," a handy little flueless appliance with a very low gas rate of about 12.5 cu.ft. per hour. Another tried and tested portable heater is the No. 3205 "Newscreen," a sheet-metal fire of lightweight and strong construction, with a gas consumption of 21 cu.ft. per hour. Both types are fitted with a lighter.

The folder also illustrates the "Velomain," a space heater suitable for entrance halls, lounges, shops, offices, &c. Its gas consumption is only 15 cu.ft. per hour, and this heats a large volume of air, which, passing through the heater, ensures good combustion without condensation, and is discharged horizontally towards the front.

"Crossley Chronicles"

The October issue of *Crossley Chronicles*—a periodical review of matters concerning Crossley land and marine type oil engines and also gas engines and gas producing plant, &c.—published by Crossley Brothers, Ltd., of Manchester, deals in detail with the up-to-date plant put down in the new works at Tottenham, of Messrs. Keith Blackman, Ltd. It will be recalled that we gave an illustrated description of these fine premises in the "JOURNAL" for July 12, and the present publication provides further particulars of the power plant which makes the new factory entirely independent of outside supply and fully self-contained. This installation may be said to have anticipated the present state of emergency and provided for the possibility of electrical main supply difficulties resulting from air attack.

"Plastic Gold"

The story of rubber in the service of mankind is well told in a 64-page booklet, "Plastic Gold," issued by the Reliance Rubber Co., Ltd., of Lots Road, Chelsea, in celebration of the Company's jubilee. Though the valuable properties of rubber were known to primitive man, civilization has used it for scarcely more than a century. To-day it is reputed to be the fifth necessity of civilization, and while it is a substitute for many things there is no general substitute for it.

Results at Melbourne

The report of the Metropolitan Gas Company of Melbourne states that the profit for the twelve months to June 30 amounts to £194,172, to which has to be added a sum brought forward of £78,985. An interim dividend was paid in February at the rate of 6s. 6d. per share, and the Directors recommended the payment of a final dividend at the same rate, leaving to be carried forward a balance of £79,407, after transferring £15,000 to Reserve Fund Account. The estimated quantity of gas made was 5,260,199,000 cu.ft., including 1,655,169,000 cu.ft. of water gas. The amount of gas sold was 4,713,751,000 cu.ft.

Conserving Fuel Resources

For the immediate present the Manchester Association of Engineers are not carrying on their usual routine of holding meetings of their Senior and Student Sections at regular intervals, but they are nevertheless making a praiseworthy effort to keep in close contact with their members. They have decided to print the Papers which would have been read and discussed in the ordinary course. They will be circulated to each Section as near as possible to the date upon which they were scheduled to be presented. It is hoped, also, that a little later on it may be found practicable to resume the regular meetings of the Association.

The Inaugural Address to the Student Section has been prepared by its Chairman, Mr. John F. West, M.A., A.M.I.Mech.E., M.S.I.C. de Fr., and contains a somewhat lengthy reference to the Gas Industry.

Mr. West states that in an age which had made itself ultimately dependent for most of the necessities and every accessory of life upon the economical use of fuel, the public was coming to see, or was, as it were, being shown from behind the scenes, that in the Gas Industry it possessed a modern, highly-organized, and efficient fuel industry, the interest and object of which could only be public service, which, in its own sphere, applied all the resources of engineering and chemical science and passed on their benefits.

After having been for practically a century from its inception a purveyor of light, the words of a now twenty-years old report of the Fuel Research Board remained true to-day—"Gas is the cheapest known means of distributing heat energy in convenient form."

Town gas, being controllable, clean, and entirely smokeless, could be used with greater efficiency than any other fuel for heating purposes, industrial and domestic, and for cooking. Highly efficient means of its convenient application had been developed, and great attention had been paid to the elimination of everything which consumers could consider to be a defect; such as the reduction of the small quantity of sulphur compounds in the gas.

The Author then dealt with the subject of coke, which he said, properly prepared and used, was an ideal, and the cheapest, smokeless solid fuel.

There was, he continued, much evidence, quite apart from urgent war-time considerations, to show that the dependence of this country, and indeed of the world, on its coal resources must increase. The conservation of coal was, therefore, of paramount importance. It was surely a matter of commonsense—and one would suggest it should be a matter of social policy—never to use any coal derivatives in a sphere for which another, representing a less consumption of coal, was peculiarly adapted. Electrical energy, indispensable and unrivalled in so many spheres, necessarily represented in heat units little more than a fifth of the value of the coal from which it was generated. In its generation nearly four-fifths of the energy of the coal were expended. The products of carbonization, gas and coke, represented in heat units nearly three-quarters of the value of the coal, and the balance was not all expended, for it included the valuable and even indispensable, by-products which were conserved. The advantage, in terms of coal conservation, of using the products of carbonization for heating purposes immediately suggested itself.

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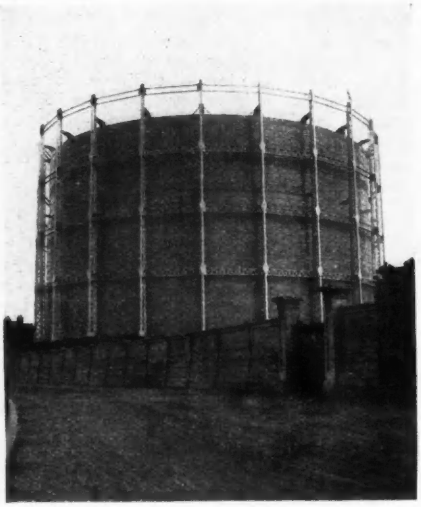

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Markets and Manufactures

Current Sales of Gas Products

The London Market

Nov. 6.

To-day's values of tar products are as follows :

Pitch 30s. to 32s. per ton f.o.b.

Creosote about 5d. per gallon.

Refined tar 3¾d. to 4d.

Pure toluole is nominal at 2s. 6d. to 2s. 7d.

Pure benzole about 1s. 9d.

95/160 solvent naphtha about 1s. 10d.

90/160 pyridine 14s. to 14s. 6d.

All per gallon naked.

Refined naphthalene crystals about £15 per ton in bags.

All *ex* makers' works.

The Provinces

Nov. 6.

Crude Gas-Works Tar, 10s. to 15s.

To avoid misunderstanding, it is necessary to state that the above price is not claimed to represent a market value. It is a price worked out from week to week upon a system which has been used for many years as a basis for the fixing of certain contracts for crude tar of varying qualities in different areas.

The average prices of gas-works products during the week were : Pitch—East Coast, 25s. to 27s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 25s. to 27s.* Toluole, naked, North, 1s. 10d. to 1s. 11d. Coal tar, crude naphtha, in bulk, North 7¾d. to 8¼d. Solvent naphtha, naked, North, 1s. 4½d. to 1s. 5d. Heavy naphtha, North, 1s. 2¼d. to 1s. 3d. Creosote, *ex* works, in bulk, North, liquid and salty, 3¾d. to 4¼d.; low gravity, 4d. to 4½d. Carbolic acid, 60's, 1s. 7d. to 1s. 10d. Naphthalene, £13 10s. to £16. Salts, 70s. to 75s., bags included. Anthracene, "A" quality, 4½d. to 4¾d. per minimum 40% purely nominal, "B" quality unsaleable. Heavy oil : Unfiltered anthracene oil, min. gr. 1,080, 4¾d. to 4⅞d.; filtered anthracene oil, min. gr. 1,080, 5½d. to 5¾d.; heavy tar oil, gr. less than 1,080 4½d. to 4¾d.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls, whatever they may be.

Scotland

GLASGOW, Nov. 4.

No material change has taken place in market conditions during the week. A fair volume of business is being put through at current prices.

Crude gas-works tar.—Actual value is round 30s. to 32s. per ton *ex* works in bulk.

Pitch of vertical quality is now available at 23s. to 24s. per ton, f.o.b. for export, and round 20s. to 22s. 6d. per ton *ex* works in bulk for home trade.

Refined tar can be secured in substantial quantities at 3¾d. to 4d. per gallon for delivery in the home market, and round 2¾d. to 3d. per gallon for export, both filled into buyers' packages at makers' works.

Creosote oil.—Throughput is well maintained with makers' prices as under : Specification oil, 4¼d. to 4½d. per gallon ; low gravity, 5d. to 5¼d. per gallon ; neutral oil, 4¾d. to 5d. per gallon ; all *ex* works in bulk.

Cresylic acid.—Enquiries are quite numerous for both prompt and forward delivery and prices are well held as follows : Pale, 97/99%, 2s. to 2s. 3d. per gallon ; dark, 97/99%, 1s. 10d. to 2s. per gallon ; pale, 99/100%, 2s. 6d. to 2s. 9d. per gallon ; all *ex* works in buyers' packages.

Crude naphtha is unchanged at 6d. to 6½d. per gallon *ex* works in bulk, according to quality.

Solvent naphtha.—90/160 grade is 1s. 6½d. to 1s. 7½d. per gallon and 90/190 heavy naphtha is 1s. 3d. to 1s. 4d. per gallon.

Motor benzole remains at 1s. 5d. to 1s. 6d. per gallon.

Pyridine.—Prices are purely nominal at 12s. to 13s. per gallon for 90/160 grade and 14s. to 15s. per gallon for 90/140 grade.

Eagle Coke Heater

In our note on the Eagle Coke Heater on page 249 of last week's issue it was mentioned in the last paragraph that John Wright & Co., Ltd. (Radiation, Ltd.), are also producing a special new small size of this heater with a heating capacity of 5,000 cu.ft. This size is particularly suitable for A.R.P. posts and has, indeed, been designed for this purpose. We regret we were misinformed as regards the makers of this latter appliance, who are also the Eagle Range and Grate Co., Ltd.

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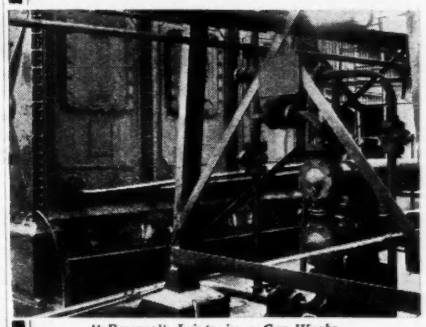
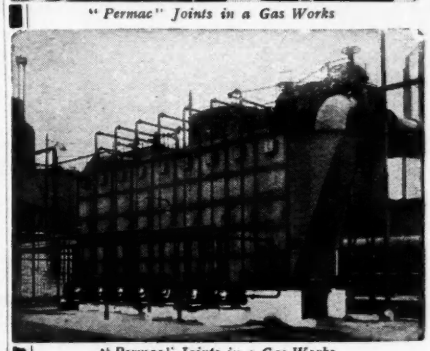
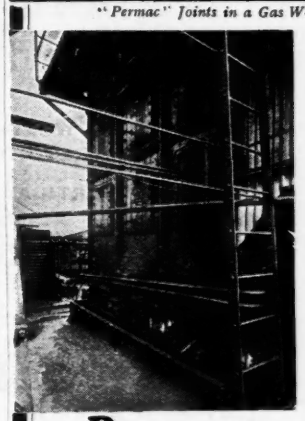


"Permac" Joints in a Gas Works



"Permac" Joints in a Gas Works.



"Permac" Joints in a Gas Works.

Be sure you get it!

Here is a selection of "Permac" joints photographed in various Gas Works. "Permac," the Metal-to-Metal Jointing, has been holding up difficult joints like these for over 25 years. Send for particulars.

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WEST'S service to the Gas Industry will continue...

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GAS STOCKS AND SHARES

The Stock Exchange finished the week on a cheerful note and although business eased up towards the close this was mainly due to shortage of supplies. It is evident that plenty of capital is available for investment, but with the imminence of the new defence loan this is being held in hand. This action held up the activity in British funds, but it is satisfactory to note that several of these stocks have now risen above their pre-war levels. Home rails remained firm and leading industrials continued in good demand.

As foreshadowed in this Report published in the "JOURNAL" of October 11, a number of companies have now reluctantly been compelled to increase the price of gas. Sir David Milne-Watson in his announcement to the Press (reported elsewhere in this issue) on behalf of the three Metropolitan Companies and the South Suburban, Tottenham and Wandsworth Companies made it quite clear that the increase of 2½d. per therm in the case of these companies was to meet only present known losses. The future is problematical, but many other losses are already beginning to operate for which no provision is made in the present increase in price. Of importance to gas investors is the certain and unfortunate knowledge that the dividends of these six companies will be reduced for the current year. The announcement came too late last week to affect the quotations of the stocks concerned, but it is probable that some proportion of any decrease in dividend has already been discounted.

Business in the Gas Market last week was a trifle heavier and more widely spread. It will be seen in the list below that several issues hardened a few points, while the only fall of note was the drop of 25½ points to 110 in North Middlesex stock. Three heavy falls also occurred in the Supplementary List.

Official Quotations on the London Stock Exchange

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Nov. 3.	Rise or Fall on Week.
1,767,439	Sept. 4	8	8	Alliance & Dublin Ord. ...	110—120	+5
374,000	June 19	4	4	Do. 4 p.c. Deb. ...	80—90	...
877,576	May 8	5	5	Asscd. Gas & Water U'd'ts Ord.	15/—17/–	...
500,000	,,	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	17/6—19/6	– 1/–
535,545	,,	4	4	Do. 4 p.c. Red. Cum. Pref.	16/—18/–	...
318,730	,,	4	4	Do. 4 p.c. Irred. Cum. Pref.	15/—17/–	...
750,000	Sept. 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	80—90	...
560,070	Aug. 21	7	7	Barnet Ord. 7 p.c.	110—130	...
300,000	Oct. 9	1/9⅜	1/4⅜	Bombay, Ltd.	18/—20/–	...
181,185	Aug. 21	9½	9½	Bournemouth Sliding Scale ...	130—150	...
690,526	,,	7	7	Do. 7 p.c. max. ...	110—130	...
493,960	,,	6	6	Do. 6 p.c. Pref. ...	110—120	...
50,000	June 5	3	3	Do. 3 p.c. Deb. ...	70—75	...
362,025	,,	4	4	Do. 4 p.c. Deb. ...	93—98	...
335,000	,,	5	5	Do. 5 p.c. Deb. ...	110—115	...
357,900	Aug. 21	7½	7½	Brighton, &c., 6 p.c. Con. ...	107—117	...
659,955	,,	6¾	6¾	Do. 5 p.c. Con. ...	100—105	...
205,500	,,	6	6	Do. 6 p.c. 'B' Pref. ...	95—105	...
855,000	Sept. 18	8	7	British Ord.	90—100	...
100,000	June 19	7	7	Do. 7 p.c. Pref.	136—141	...
350,000	,,	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	110—115	...
120,000	June 5	4	4	Do. 4 p.c. Red. Deb. ...	92—97	...
450,000	,,	5	5	Do. 5 p.c. Red. Deb. ...	100—105	...
450,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	89—94	...
100,000	22 May '33	6	4	Cape Town, Ltd.	½—¾	...
100,000	6 Nov. '33	4½	4½	Do. 4½ p.c. Pref.	½—¾	...
150,000	June 19	4½	4½	Do. 4½ p.c. Deb.	58—68	...
626,860	July 17	6	6	Cardiff Con. Ord.	95—105	...
237,860	June 5	5	5	Do. 5 p.c. Red. Deb. ...	97—102	– 5
98,936	Oct. 9	2/–	2/–	Colombo Ord.	1⅛—1⅜	..
24,510	,,	1/4⅜	1/4⅜	Do. 7 p.c. Pref.	20/6—22/6	...
739,453	Sept. 27	–/11.48	–/11.48	Colonial Gas Assn. Ltd. Ord. ...	15/6—17/6	...
296,144	,,	1/3.30	1/3.30	Do. 8 p.c. Pref.	20/6—22/6	...
1,775,005	July 31	4	4	Commercial Ord.	50—60	...
140,000	Aug. 21	4	4	Do. 4 p.c. Red. Pref. ...	90—95	...
620,000	June 5	3	3	Do. 3 p.c. Deb.	55—60	...
286,344	Aug. 21	5	5	Do. 5 p.c. Deb.	85—95	...
200,000	,,	3¾	3¾	Do. 3¾ p.c. Red. Deb. ...	94— 99	...
807,560	July 31	7	7	Croydon sliding scale	100—110	...
644,590	,,	5	5	Do. max. div.	80—85	...
620,385	June 19	5	5	Do. 5 p.c. Deb.	90—100	...
208,660	Aug. 21	5	5	Dudley, Brierley Hill & Dist. Ord.	100—105	...
82,275	,,	5	5	Do. 5 p.c. Con. Pref. ...	92—102	...
79,000	,,	3¾	3¾	Do. 3¾ p.c. Red. Deb. ...	94—99	...
239,000	July 31	5	5	East Hull Ord. 5 p.c.	86—91	...
187,215	Aug. 21	6	5¾	East Surrey Ord. 5 p.c. ...	98—103	...
176,211	June 5	5	5	Do. 5 p.c. Deb. ...	105—110	...
250,000	July 3	4	8	Gas Consolidation Ord. 'B' ...	18/6—20/6	...
250,000	May 22	4	4	Do. 4 p.c. Red. Cum. Pref.	18/—20/–	...
9,172,463	July 31	5¾	5¾	Gas Light & Coke Ord. ...	17/—19/–*a*	–/6
2,600,000	,,	3½	3½	Do. 3½ p.c. max.	58—63	...
4,477,106	,,	4	4	Do. 4 p.c. Con. Pref. ...	75—80	+2
2,993,000	July 3	3¾	3¾	Do. 3¾ p.c. Red. Pref. ...	80—85	...
8,602,497	May 22	3	3	Do. 3 p.c. Con. Deb. ...	60—65	...
3,642,770	,,	5	5	Do. 5 p.c. Red. Deb. ...	97—102	...
1,500,000	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	93—98	...
700,000	Sept. 4	3½	3½	Do. 3½ p.c. Red. Ded. ...	85—90	...
270,466	July 31	6	6	Harrogate New Cons.	95—100	...
157,500	Mar. 20	‡1/–	‡1/–	Hong Kong and China Ord. ...	⅛—¼	..
5,600,000	Oct. 23	12	4	Imperial Continental Cap. ...	80—90*	+2
172,810	July 31	3½	3½	Do. 3½ p.c. Red. Deb. ...	85—95	...
63,480	June 19	3	3	Maidstone 3 p.c. Deb.	57—62	...
45,000	May 22	†10	†10	Malta & Mediterranean ...	95—105	...
				Metropolitan (of Melbourne) ...		
392,000	Oct. 2	5½	5½	5½ p.c. Red. Deb.	95—100	...
231,977	Aug. 21	5	5	M.S. Utility 'C' Cons.	75—85	...
968,658	,,	4	4	Do. 4 p.c. Cons. Pref. ...	74—79	...
390,076	June 19	4	4	Do. 4 p.c. Deb. ...	88—93	...

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Nov. 3.	Rise or Fall on Week.
148,955	June 19	5	5	M.S. Utility 5 p.c. Deb. ...	90—100	...
125,000	July 3	3½	3½	Do. 3½ p.c. Red. Bds. ...	92—95	...
675,000	May 8	†6	†3	Montevideo, Ltd.	52—62	...
250,000	Aug. 21	7½	7½	North Middlesex 6 p.c. Con. ...	105—115	– 25½
396,160	July 31	5	5	Northampton 5 p.c. max. ...	101—106	...
300,000	April 24	†9	†7	Oriental, Ltd.	120—130	...
468,537	June 5	7	8	Plymouth & Stonehouse 5 p.c.	105—115	...
621,667	July 31	8½	8½	Portsmouth & Gosport Cons.	110—120	...
241,446	,,	5	5	Do. 5 p.c. max.	95—100	...
73,350	,,	5	5	Do. 5 p.c. Pref.	80—90	...
75,000	,,	4	4	Do. 4 p.c. Pref.	77—82	...
114,000	July 31	5	5	Preston 5 p.c. Pref.	90—100	...
247,966	June 19	4	4	Primitiva 4 p.c. Cons. Deb. ...	95—100	...
625,959	July 17	4	4	Do. 4 p.c. Red. Deb. ...	93—98	...
15,000	Sept. 4	6	6	San Paulo 6 p.c. Cum. Pref. ...	7¼—8½	...
441,275	Oct. 9	1/1½	1/1½	Severn Val. Gas Cor. Ld. Ord.	16/—19/–	...
460,810	Oct. 2	–/10½	–/10½	,, ,, 4½ p.c. Cum. Pref. ...	16/—18/–	...
133,201	Aug. 21	5	8½	Shrewsbury 5 p.c. Ord. ...	107—117	..
9,000	June 5	‡4	‡4	South African Ord.	4—5	...
1,996,297	Aug. 21	1/2⅜	1/2⅜	South East'n Gas Cn. Ld. Ord.	15/6—17/6	...
1,000,000	,,	–/10⅜	–/10⅜	Do. 4½ p.c. Red. Cum. Pref.	17/—19/–	...
769,191	,,	4	4	Do. 4 p.c. Cum. Pref. ...	15/—17/–	...
450,000	,,	4	4	Do. 4 p.c. Deb.	95—100	...
150,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	...
6,709,895	July 31	6	5	South Met. Ord.	65—75	...
1,135,812	,,	6	6	Do. 6 p.c. Irred. Pref. ...	90—100	...
850,000	,,	4	4	Do. 4 p.c. Irred. Pref. ...	70—80	...
1,895,445	June 19	3	3	Do. 3 p.c. Deb.	60—65	...
1,000,000	July 17	5	5	Do. 5 p.c. Red. Deb. ...	97—102	...
600,000	,,	3¾	3¾	Do. 3¾ p.c. Red. Deb. ...	92—97	...
1,543,795	July 31	6	6	South Suburban Ord. 5 p.c. ...	80—90	...
512,925	,,	5	5	Do. 5 p.c. Pref.	82—92	...
500,000	,,	4	4	Do. 4 p.c. Pref.	75—85	...
250,000	,,	3¾	3¾	Do. 3¾ p.c. Red. Pref. ...	89—94	...
888,587	June 5	5	5	Do. 5 p.c. Deb.	90—100	...
250,000	,,	4	4	Do. 4 p.c. Deb.	89—94	...
200,000	July 31	3	3½	Do. 3½ p.c. Red. Deb. ...	89—94	...
427,859	Sept. 18	1/2⅜	9⅜	S. Western Gas & Water Ord.	14/—16/–	...
160,523	Oct. 9	–/10½	–/10½	Do. 4½ p.c. Red. Cum. Pref.	17/6—19/6	...
110,000	June 5	4	4	Do. 4 p.c. Red. Deb. ...	92—97	...
750,541	July 31	5½	5	Southampton Ord. 5 p.c. ...	75—85	...
148,836	June 5	4	4	Do. 4 p.c. Deb.	80— 90	...
350,000	July 31	5½	5½	Swansea 5½ p.c. Red. Pref. ...	90—100	...
200,000	June 19	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—100	..
1,076,490	July 31	6⅝	6½	Tottenham and District Ord....	90—100	+3
409,835	,,	5½	5½	Do. 5½ p.c. Pref.	100—110	...
62,235	,,	5	5	Do. 5 p.c. Pref.	83—93	+3
453,380	June 19	4	4	Do. 4 p.c. Deb.	87—92	...
85,701	June 5	6	6	Tuscan 6 p.c. Red. Deb. ...	95—100	...
1,247,505	Oct. 23	6	4	U. Kingdom Gas Cor. Ord. ...	13/—16/–	...
1,085,952	May 8	4½	4½	Do. 4½ p.c. 1st Cum. Pref. ...	14/—17/–	...
772,709	,,	4	4	Do. 4 p.c. 1st Red. Cum. Pf.	15/—18/–	...
745,263	June 5	4½	4½	Do. 4½ p.c. 2nd Non-Cum. Pf.	13/6—15/6	...
1,093,656	Sept 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	85—95	...
378,106	Mar. 6	7	7	Uxbridge, &c., 5 p.c.	90—100	...
133,010	,,	5	5	Do. 5 p.c. Pref. ...	95—105	+5
1,371,138	July 31	7	6½	Wandsworth Consolidated ...	90—100	...
2,525,768	,,	4	4	Do. 4 p.c. Pref.	65—75	...
1,343,964	June 19	5	5	Do. 5 p.c. Deb.	90—100	...
383,745	,,	4	4	Do. 4 p.c. Deb.	75—85	...
400,000	,,	3¾	3¾	Do. 3¾ p.c. Red. Deb. ...	92—97	...
558,342	July 31	6⅜	6⅜	Watford and St. Albans Ord. ...	90—100	...
200,000	,,	5	5	Do. 5 p.c. Pref.	80—90	...
200,000	,,	5½	5½	Do. 5½ p.c. Pref.	100—110	...
200,000	,,	4	4	Do. 4 p.c. Rd. Pf. (1973/8)	90—95	...
100,000	—	—	—	Do. 4 p.c. Red. Pf. (1959)	97—102	...
200,000	June 19	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...
200,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	83—88	...

a.—The quotation is per £1 of Stock. * Ex. Div. † Paid free of income-tax. ‡ For year. § Actual.

Supplementary List and Provincial Exchanges overleaf.

STOCK AND SHARE LIST—Contd.

Supplementary List, not Officially Quoted, London

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Nominal Quotations Nov. 3.	Rise or Fall on Week.
202,152	Sept. 4	5	5	Ascot Ord.	95—100	...
128,182	July 3	5	5	Do. 5 p.c. Pref.	101—106	...
31,035	Aug. 21	–/4⅛	–/4⅛	Associated Utilities 4 p.c. Pref.	15/—17/–	..
100,000	June 19	3⅛	3⅛	Do. 3⅛ p.c. Red. Deb. ...	93—98	...
17,000	Aug. 21	8	8	Bognor Orig. Ord. 'A' ...	137—147	...
62,210	,,	8	8	Do. New Add. 'A' ...	105—115	...
87,160	,,	7	7	Do. New 7 p.c. max. ...	100—110	...
37,440	July 31	10	10	Cam. Univ. & Town 10 p.c. max.	110—120	...
125,970	,,	7	7	Do. 7 p.c. max.	90—100	...
39,025	,,	5	5	Do. 5 p.c. max.	80—90	...
96,410	July 17	4½	4½	Cardiff 4½ p.c. Pref.	92—97	...
55,520	July 31	6	6	Colchester 6 p.c. Pref. ...	113—118	...
90,550	Sept. 18	5	5	Do. 5 p.c. Deb. ...	100—105	...
150,000	July 31	4	4	Croydon 4 p.c. Pref.	84—89	...
130,000	June 19	4	4	Do. 4 p.c. Deb.	90—95	...
65,000	Aug. 21	7½	7½	Eastbourne 'A' 5 p.c. ...	120—130	...
198,000	,,	6	6	Do. 'B' 3½ p.c.	103—113	...
112,312	,,	5	5	Do. 5 p.c. Pref.	100—105	...
130,000	June 19	5	5	Do. 5 p.c. Deb.	105—110	...
130,500	Aug. 10	7½	7½	Exeter New Ord. (£10)	13½—15½	...
24,000	Aug. 21	8½	8½	Gt. Yarmouth 8½ p.c. max. (£30)	24—29	...
59,400	,,	7½	7½	Do. 7½ p.c. max. (£30) ...	26—31	...
51,160	June 5	5½	5½	Do. 5½ p.c. Deb.	115—120	...
152,600	Sept. 4	9	8	Guildford Cons.	145—155	...
54,055	,,	5	5	Do. 5 p.c. Pref.	100—105	...
68,250	June 5	5	5	Do. 5 p.c. Deb.	103—108	...
156,600	Aug. 21	7	7	Hampton Court Cons. ...	100—110	...
86,046	June 19	14½	‡5	Holyh'd&N.W.G.&W.Cpn.Ord.	13/6—15/6	...
80,000	Aug. 21	4	4	Lea Bridge 4 p.c. Pref. ...	78—83	...
60,000	,,	6	6	Do. 6 p.c. Pref.	113—118	...
94,876	June 5	4	4	Do. 4 p.c. Deb.	87—92	...
73,620	Sept. 18	8¾	8¾	Luton Cons. 'A'	150—160	...
107,960	Sept. 18	5½	4	Mid Kent Ord. (£10) ...	8—9	...
230,940	July 31	10	10	Oxford & District Ord. ...	145—155	...
47,112	,,	5	5	Do. 5 p.c. Pref.	95—105	...
50,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	106—111	...
126,193	Oct. 30	7½	7½	Peterborough Ord.	134—139*	...
64,990	Sept. 18	7½	7	Redditch Ord.	110—120	...
166,850	July 31	8	8	Romford Ord.	110—120	–24½
60,000	,,	4	4	Do. 4 p.c. Pref.	95—100	...
44,000	Sept. 18	5	5	Do. 5 p.c. Deb.	105—110	...
25,570	July 31	5½	5½	Rugby 5½ p.c. Pref.	116—121	...
25,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	103—108	...
42,750	June 5	5½	5½	Do. 5½ p.c. Deb.	113—118	...
110,950	Aug. 21	8	8	Ryde Ord.	100—110	–37
270,086	Sept. 4	7	7	Slough Ord.	120—130	...
21,000	June 5	5	5	Do. 5 p.c. Deb.	103—108	...
28,872	May 8	5½	5½	S. Midland Gas Cpn. Ltd. Ord.	16/—18/–	...
28,866	Sept. 18	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	16/6—18/6	...
117,228	Aug. 21	7	5	Swindon Cons.	75—80	..
60,425	June 5	5	5	Do. 5 p.c. Deb.	103—108	...
64,380	June 19	5	5	Torquay & Paignton 5 p.c. Pref.	102—107	...
130,000	Aug. 21	8	5	Wakefield Ord.	101—106	...
81,650	,,	5	5	Do. 5 p.c. max.	81—86	...
82,000	July 31	6	6	Weymouth Ord.	101—106	...
273,626	Aug. 21	7	7	Wolverhampton Cons. Ord. ...	100—110	– 14½
98,384	,,	6	6	Do. 6 p.c. Pref.	113—118	...
160,000	June 19	5½	5½	Do. 5½ p.c. Red. Deb. ...	102—107	...
106,490	Aug. 21	5½	5½	Wrexham Ord.	89—94	...
90,000	June 19	5	5	York 5 p.c. Red. Deb.	102—107	...
133,640	July 31	6½	6	Yorktown (Cam.) 5 p.c. Cons.	112—117	...
120,000	,,	5	5	Do. 5 p.c. Pref.	100—105	...
35,000	June 19	5½	5½	Do. 5½ p.c. Deb.	110—115	...

BRISTOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Nov. 3.	Rise or Fall on Week
347,756	July 31	6	5	Bath Cons.	107—112	...
1,667,250	,,	5	5	Bristol, 5 p.c. max.	97—100	–¼
120,420	June 5	4	4	Do. 1st 4 p.c. Deb.	89—93	...
415,250	,,	4	4	Do. 2nd 4 p.c. Deb. ...	89—93	...
328,790	,,	5	5	Do. 5 p.c. Deb.	107—111	+2½
274,000	July 31	5	5	Newport (Mon.) 5 p.c. max. ...	90—95	...
13,200	Sept. 4	8½	7	Pontyp'l Gas & W. 10 p.c. 'A'	12—13	...
13,600	,,	6	5	Do. 7 p.c. 'B'	10½—11	...
40,000	,,	6	5	Do. 7 p.c. 'C'	10½—11	...
140,778	July 31	5	5	Weston-super-Mare Cons. ...	93—98	...
64,338	June 19	4	4	Do. 4 p.c. Deb.	90—95	...
33,340	,,	7½	7½	Do. 7½ p.c. Deb.	140—150	...

LIVERPOOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Nov. 3.	Rise or Fall on Week
157,150	July 31	6½	5	Chester 5 p.c. Ord.	100—103	...
92,500	June 5	4	4	Do. 4 p.c. Pref.	75—85	–7½
36,430	,,	3½	3½	Do. 3½ p.c. Deb.	86—89	...
41,890	,,	4	4	Do. 4 p.c. Red. Deb. ...	96—100	...
2,167,410	Aug. 21	6	6	Liverpool 5 p.c. Ord.	99—101	+5
245,500	June 19	5	5	Do. 5 p.c. Red Pref. ...	90—95	–10
306,083	July 17	4	4	Do. 4 p.c. Deb.	99—101	...
106,280	July 31	10	10	Preston 'A' 10 p.c.	174—184	...
188,219	,,	7	7	Do. 'B' 7 p.c.	126—136	...

NEWCASTLE EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Nov. 3.	Rise or Fall on Week
122,577	Aug. 21	8	8	Blyth 5 p.c. Ord.	146½—148½	...
732,000	Aug. 21	3	4	Hartlepool G. & W. Cn. & New	74½—76½	...
2,061,315	July 31	5¾	5	Newcastle & Gateshead Con.	17/9—18/3a	–1/–
682,856	,,	4	4	Do. 4 p.c. Pref.	75—85	...
776,706	June 5	3½	3½	Do. 3½ p.c. Deb.	84—89	...
277,285	April 24	5	5	Do. 5 p.c. Deb. '43	100—105	...
332,351	Aug. 21	6	6	Sunderland 6 p.c. max. ...	110—120	...

NOTTINGHAM EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Nov. 3.	Rise or Fall on Week
542,270	Aug. 10	9	6	Derby Con.	110—120	...
55,000	June 19	4	4	Do. 4 p.c. Deb.	100—105	...
20,000	June 19	5	5	Long Eaton 5 p.c. Pref. ...	9—11	...
80,000	,,	5	5	Do. 5 p.c. Deb. ...	100—105	...

SHEFFIELD EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Nov. 3.	Rise or Fall on Week
10,000	Aug. 21	10	10	Great Grimsby 'A' Ord. ...	180—190	...
6,500	,,	10	10	Do. 'B' Ord. ...	180—190	...
79,000	,,	10	10	Do. 'C' Ord. ...	175—185	...
1,806,339	Feb. 20	6½	6½	Sheffield Cons.	120—123	...
95,000	July 3	4	4	Do. 4 p.c. Deb.	99—101	...

a The quotation is per £1 of Stock.
* Ex. div. ‡ For year.

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